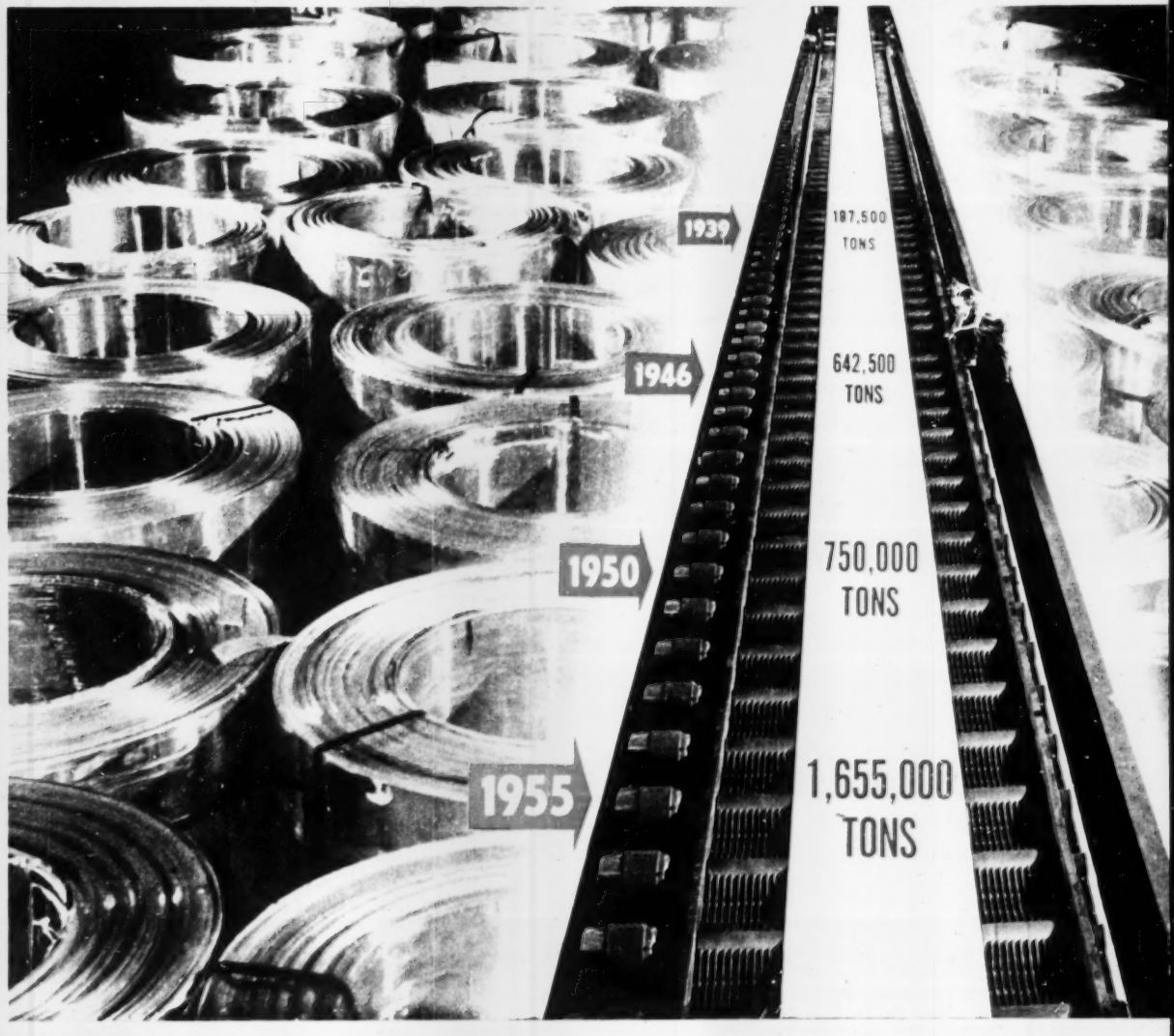
MARCH 23, 1953

STEEL

THE WEEKLY MAGAZINE OF METALWORKING



✔ **LABOR OUTLOOK**
Relatively Calm Year Ahead, p. 47

✔ **TITANIUM CUTTING GUIDEPOSTS**
Research Provides Answers, p. 76

ALUMINUM

Squeeze will ease by end of 1953. New facilities boost light metal to No. 2 spot in tonnage — p. 58

How EC&M Frequency Relay Control improves A-C Bucket Cranes

Bucket crane of the Level-Luffing type operates speedily under EC&M Contra Torque Hoist Control.

Bucket cranes in this fertilizer plant operate at high output with EC&M Contra Torque Hoist Control.

FAST GETAWAY—Quickly responsive to the frequency of the induced-rotor voltage, EC&M Frequency Relays match torque requirements to the load . . . get the motor up to speed quickly for lowering the bucket —to move the trolley in or out . . . cut down the time between trips.

WIDE SPEED SELECTION—These Relays permit starting-down on any master switch point—no waiting until last point is reached. And a better speed choice gives greater flexibility in clean-up operations, and speeds up output.

SMOOTH STOPPING—When checking motor lowering speed, weak torques are provided for light loads or the empty bucket; stronger torques for heavier loads. Trolley motor is stopped and reversed smoothly under Frequency Relay automatic operation.

SPEED-LIMITING *Safety* on all Speeds. These relays (one set for hoisting and lowering) automatically shift motor connections to safeguard lowering operation with greater skill than human hands could do it.

It Pays To Specify EC&M *Control*

THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79TH STREET • CLEVELAND 4, OHIO

61-Ton Weldment Is Bed for Straightening Press

Resembling a huge girder for a monumental bridge, this giant weldment is the bed for a 1000-ton straightening press for the A. B. Farquhar Division of the Oliver Corporation. It is made from plate steel, and consists of three webs, spaced about 9 in. apart, welded to the top and bottom sections.

The webs are 1¼ in. thick, and for extra reinforcement are connected to each other by lengths of 4-in. pipe, spaced at regular intervals. The top and bottom sections of the bed are 4½ in. thick. The weldment, 3 ft, 7½ in. wide, 5 ft high, and 50 ft long, has a total weight of 122,122 lb.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

WELDMENTS

can give you these benefits . . .

Scores of manufacturers of machinery and machine parts are benefiting through these advantages of Bethlehem Weldments:

1. **ECONOMY.** Bethlehem Weldments eliminate excess weight, without any sacrifice in rigidity. And lighter weight frequently leads to a lower manufacturing cost for the finished product.

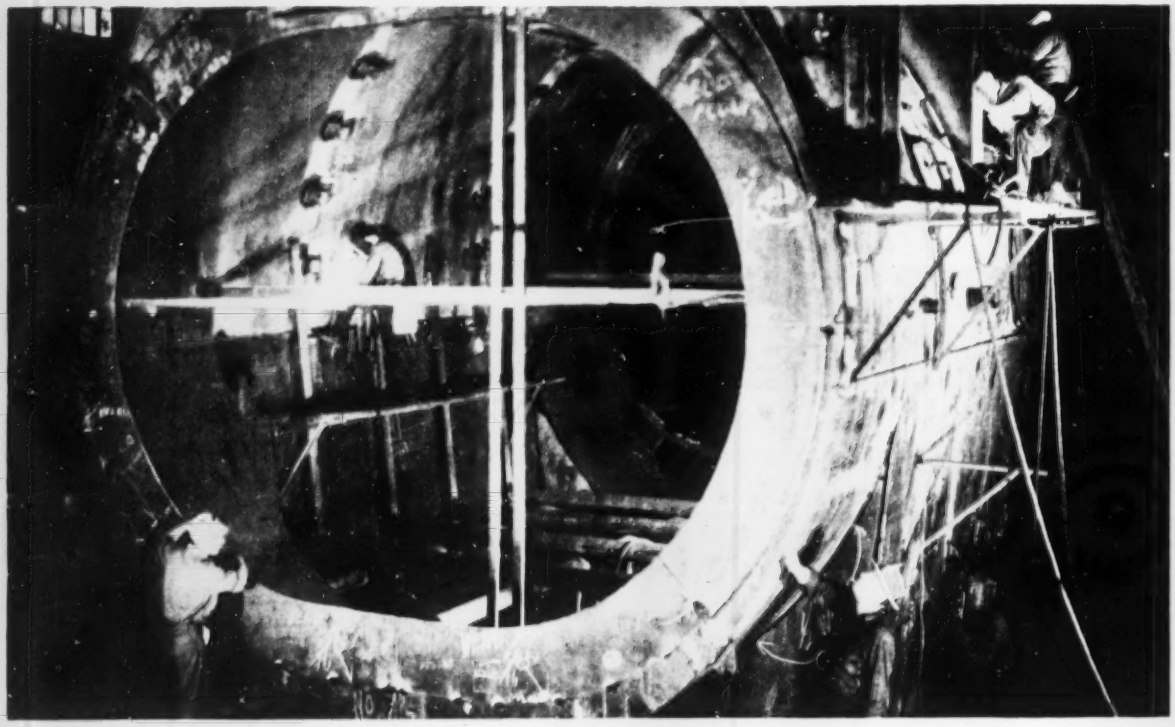
2. **VERSATILITY.** Bethlehem Weldments cover a wide range of sizes. What's more, they can serve either as simple parts, or as units of intricate assemblies.

3. **FREEDOM OF DESIGN.** There is hardly any limit to the design possibilities of these weldments, as the steel from which they are made can be bent, pressed or shaped prior to welding, without harm to its physical structure.

4. **FREEDOM OF USE.** Bethlehem Weldments are often used alone. And just as often, they are used effectively in combination with forgings or castings.

The nearest Bethlehem office will be pleased to discuss weldments with you. Get in touch with us at any time.

BETHLEHEM WELDMENTS



This formula helps an entire industry!

More and more firms in the chemical industry are coming to rely on this formula:

Barium Steel Corporation—best source for structural and steel plate, fabricated forms and finished products of steel, aluminum, magnesium, Fiberglas, plastics.

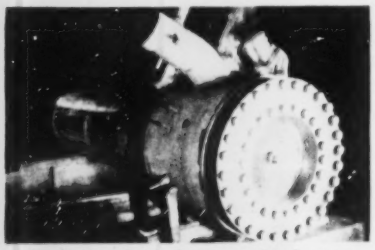
The reason for this conviction is that the group of strategically located companies comprising Barium Steel Corporation serves the chemical industry as a *unified* source for its structural and equipment requirements, controlling quality from blast furnace to end product, working as a self-contained supplier of urgently needed material.

For example, in the scene above, workers at Barium's Central Iron and Steel Company are building a giant condenser shell from Central plate, which is also fabricated into tanks, heat exchangers and piping for the process industries. Other Barium subsidiaries (see photos below) supply the chemical field with a number of important components.

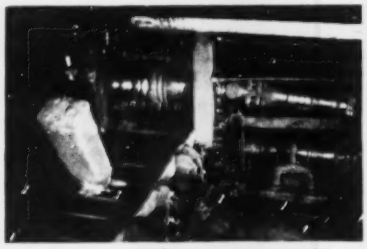
Whatever your industry, Barium can provide you with the same kind of service. For details, write Barium Steel Corporation, 25 Broad Street, New York City. No obligation.

BAYONNE BOLT CORP. • CENTRAL IRON AND STEEL COMPANY • CHESTER BLAST FURNACE • CLYDE IRON WORKS, INC. • CUYAHOGA SPRING COMPANY • EAST COAST AERONAUTICS, INC. • ERIE BOLT AND NUT COMPANY • GEOMETRIC STAMPING CO. • GLOBE FORGE INCORPORATED • INDUSTRIAL FORGE & STEEL, INC. • JACOBS AIRCRAFT ENGINE CO. • KERMATH MANUFACTURING CO. • KERMATH LIMITED (CANADA) • PHOENIX BRIDGE CO. • PHOENIX IRON & STEEL CO. • WILEY MANUFACTURING CO.

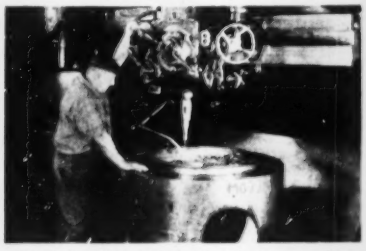
3.5



THE HEAD of this Cummus Co. heat exchanger unit is securely fastened by bolts and studs specially made by Barium's Erie Bolt and Nut Co. Specialty studs for the industry are also produced by Barium's Bayonne Bolt Corp.



THIS INGOT in the blooming mill at Phoenix Iron and Steel Co. will ultimately become structural steel, which is widely used in the chemical industry for the construction of new processing equipment.



HEAT EXCHANGER manufacturers like Griscom-Russell Company take heavy forgings of Barium's Industrial Forge & Steel, Inc., and fabricate them into parts that resist temperature, high pressure, and the corrosive action of chemicals.

Macwhyte 6x25E PREformed Monarch Whyte Strand Wire Rope with I.W.R.C.

How many moving parts?

- In this particular rope construction there are 199 individual wires. Each is a carefully designed "moving part."
- Outside wires are one size. Inside wires are another size. Core and filler wires are still other sizes.
- Altogether, 8 different sizes of wire are used, and each has a specified strength, toughness and flexibility.
- Macwhyte has specialized in the manufacture of wire rope like this for over half a century.
- To assure highest quality, all stages of wire manufacture and rope fabrication are closely controlled.
- An exact "breathing space" between each wire is provided in order to increase flexibility.
- Each wire is protected with a film of lubricant that is force-fed *cold* during the fabricating.
- Since any piece of wire rope is a complicated piece of machinery, precision is as important in its manufacture as in the making of a fine watch.
- In designing and manufacturing its thousand and one wire ropes, Macwhyte exercises all the special care that assures long service and low cost to you. May our engineers recommend the right rope for *your* equipment?

MACWHYTE WIRE ROPE

THE RIGHT ROPE FOR YOUR EQUIPMENT

Ask for G-15 Handbook

MACWHYTE COMPANY
KENOSHA, WIS.

1032

MACWHYTE COMPANY

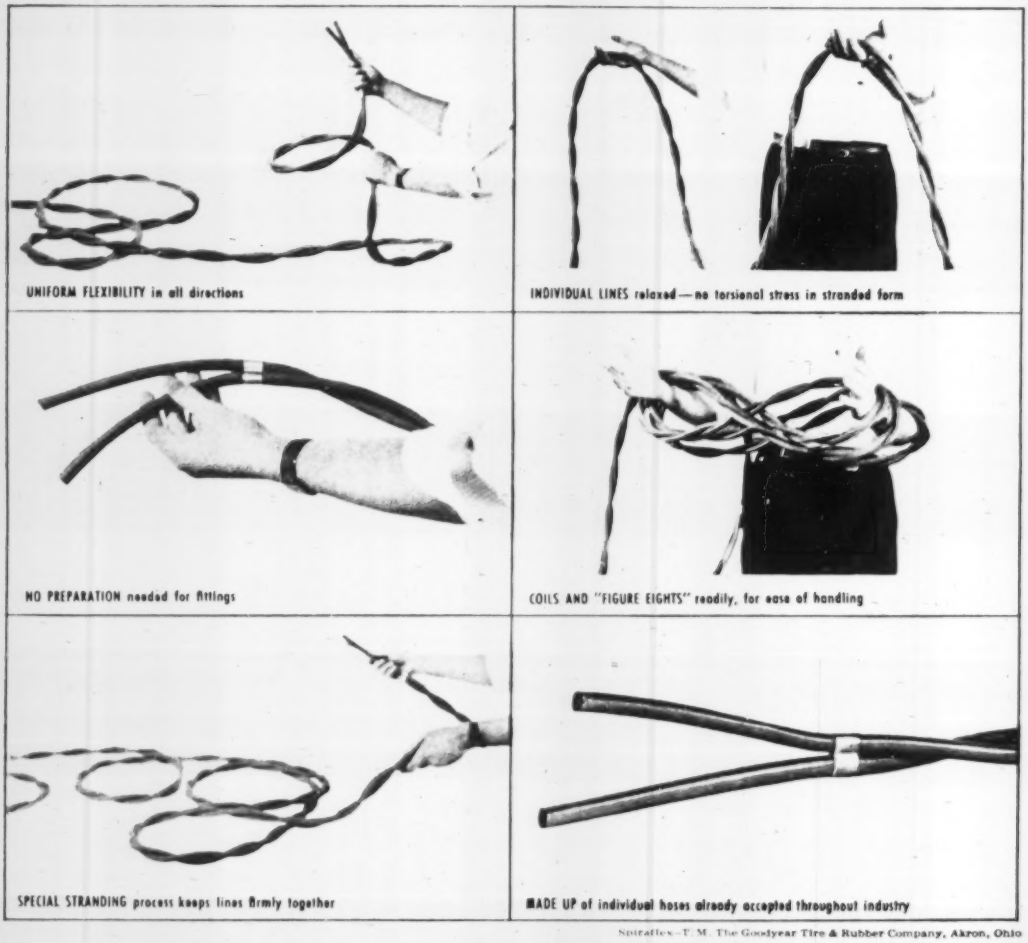
2912 Fourteenth Avenue, Kenosha, Wis. Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel Wire Rope and Wire Rope Assemblies. Mill depots: New York • Pittsburgh • Chicago • St. Paul • Fort Worth • Portland • Seattle • San Francisco • Los Angeles • Distributors throughout U.S.A.

Look at the advantages with NEW
SPIRAFLEX WELDING HOSE

WELDERS everywhere are welcoming Goodyear's new Spiraflex welding hose, because it gives them an ideal combination of working advantages no other hose can offer.

Spiraflex hose is *uniformly* flexible in all directions —making for ease of handling. It needs no special preparation for fittings—is lighter than other hose with same welding pressure, because Spiraflex is reinforced with rayon for high strength and light weight.

Ask your distributor about Spiraflex Welding Hose — in stock in 3/16", 1/4" and 5/16" sizes, and available in other sizes and combinations. Or write Goodyear, Mechanical Goods Div., Akron 16, Ohio.



UNIFORM FLEXIBILITY in all directions

INDIVIDUAL LINES relaxed—no torsional stress in stranded form

NO PREPARATION needed for fittings

COILS AND "FIGURE EIGHTS" readily, for ease of handling

SPECIAL STRANDING process keeps lines firmly together

MADE UP of individual hoses already accepted throughout industry

Spiraflex—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

GOODYEAR

THE GREATEST NAME IN RUBBER

We think you'll like "THE GREATEST STORY EVER TOLD"—every Sunday—ABC Radio Network—THE GOODYEAR TELEVISION PLAYHOUSE—every other Sunday—NBC TV Network

This Week in Metalworking

STEEL

Vol. 132 No. 12 Mar. 23, 1953

✓NEWS ✓PRODUCTION-ENGINEERING ✓MARKETS

✓ **Metalworking Outlook** 39
What's ahead for metalworking? The editors explore various aspects of industry to help you plan for the future

As the Editor Views the News 43

Windows of Washington 54

Mirrors of Motordom 61
Detroit Editor Floyd G. Lawrence comments on what's new in metalworking's biggest market

The Business Trend 65

Men of Industry 69

✓ **Production—Engineering News at a Glance** 75

Guideposts to Titanium Cutting 76
It can be machined but efficiency is another matter. Lots of room for improvement in cutting tools and fluids

Induction Heating Cuts Costs on Many Fronts 80
Surface hardening, where induction heating got its start, is outnumbered by other varied applications

Small-Lot Stampings Produced Economically 83
Overpressing process uses inexpensive female dies and forms sheet metal products without usual wrinkles

Drums Come Clean and Rust-Inhibited 84
Continuous line turns out scale-free barrels with phosphate coatings. They hold their paint finish longer

Progress in Steelmaking 86
Don't Write Off the Blast Furnace Part II of this four-section treatise considers preparation and capacities

New Products and Equipment 107

✓ **The Market Outlook** 125
Metal Prices and Composites begin on Page 126

The Metal Market 137

Behind the Scenes	6	Obituaries	72
Letters to the Editors	10	Calendar of Meetings	96
Subcontract Summary	52	Helpful Literature	121
Checklist on Controls	53	Metalworking Notes	147

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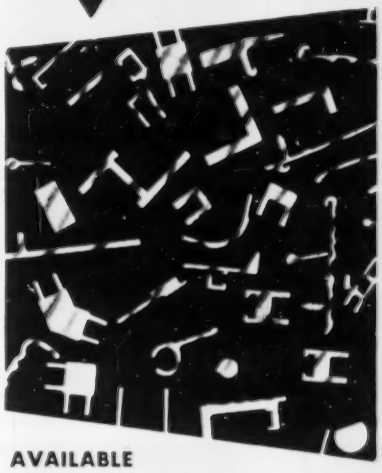
Over 4000 Standard

PE ALUMINUM EXTRUSIONS



AVAILABLE WITHOUT DIE SERVICE CHARGE

or Special Designs to fit your needs

Precision Extrusions catalogs over 4000 standard sizes and shapes of extruded aluminum rods, bars, shapes, and tubing, serving a wide variety of applications in transportation, architecture, and general industry. Or, if your product requirements call for a specially-designed extrusion, PE engineers will work with you in answering your problems of design, alloy-selection, and production.

PERSONALIZED SERVICE and specialization in aluminum extruding assures you of prompt handling of your inquiry, careful production supervision, and extrusion quality meeting the highest standards of the industry.

COMPLETE FACILITIES include design engineering, die making, billet casting, extrusion production, and standard finishing operations.

ENGINEERING ASSISTANCE is available without obligation. If your present or future plans call for quality aluminum extrusions in standard or special shapes, call on PE, or write, on your company letterhead, for our new complete catalog.

QUALITY • SERVICE

PE

PRECISION EXTRUSIONS

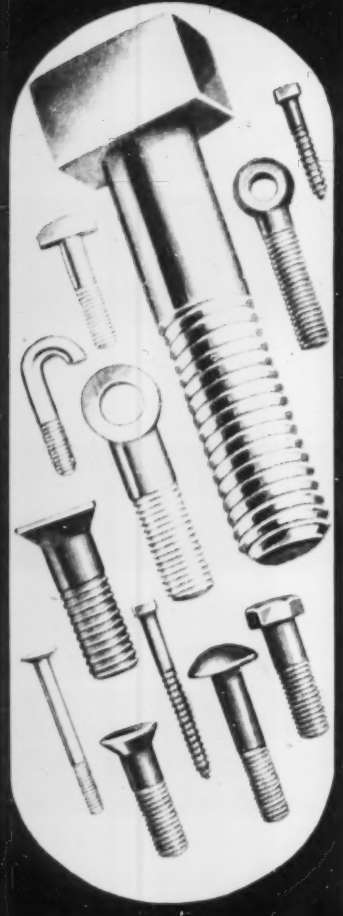
BENSENVILLE, ILLINOIS

CHICAGO: TUxedo 9-1701 • BENSENVILLE 98

THREADED SPECIALTIES

TEE BOLTS

by an exclusive method



Among Pawtucket's many specialty products, these lower-cost tee-head bolts are the leaders in this field. Pawtucket's exclusive production method keeps cost low, dimensional accuracy unusually high and strength above standard.

Pawtucket tee-head bolts are made in standard sizes ¼" and larger, or to your specifications. In any size, you can depend on a uniform Class 3 fit, if required.

BETTER BOLTS SINCE 1882

PAWTUCKET

"THE BOLT MAN"

MANUFACTURING COMPANY

327 Pine Street Pawtucket, R. I.

THE PLACE TO SOLVE YOUR BOLT PROBLEMS

T.M. REG.

First Sign of Spring

It is now officially time to sing out with Shrdlu's famous spring poem once again, so here goes:

Spring has sprung
The grass has riz
I wonder where
The flowers is?

Misdirected

During the war years it used to happen quite frequently but it has been a long time now since our mail has been misdirected down to Washington to the Pentagon Building. Sure enough, however, last week a package finally caught up with us, having been down to the big five-sided building on the Potomac by mistake because it said Pentagon building instead of Penton building.

Program for Management

In next week's issue you will find the second in STEEL's Program for Management Series. Managing editor, Walter Campbell, has dug deep into the problem of industry-government relations, and we are sure that you will find it the typical top-drawer job that Walter produces with regularity. It will be entitled "Mr. B. Looks to Washington."

Sounds Good, Coming From You!

We were telling you a little bit last week about the interviews conducted by Daniel Starch and Staff to help determine which advertisements are best read. The Starch interviewer also picks up some interesting comments which indicate that while STEEL is not "all things to all readers", it certainly is many things to most of them. Here for example are some of the things that were said by the folks interviewed a few weeks ago:

"I get a lot of good from the marketing information . . . I use it for reference . . . Of the two books covering this field, this is by far the better magazine for my purposes . . . it keeps us up-to-date on current developments in industry . . . The scrap market and market prices are very valuable to me . . . It has some fascinating articles in it . . . It is a leader in our trade . . . It is valuable for purchasing various kinds of steel and equipment . . . I enjoy the news of Washington . . . the news of Motordom, and Shaner's editorials are the best . . . They do a good job on their ads, and I read the market news and metalworking articles, too . . . We have used it as a purchasing aid and I always read the editorials . . . There is always something of importance in it . . . I have read it for 20 years. It's the only national metal magazine we take . . . I think it's a perfect magazine, the ads are interesting and colorful and the articles are of major interest . . . I like it, I think it's the best. In fact, it's the only one I subscribe to. I like the editorials very much and I think it is very good for the purchasing agent, particularly one who has contact with plant production . . . The magazine aids me in commercial research. It helps in new production, too . . . It is excellent. It always has something interesting and I check the new products regularly. I read it as soon as it comes, then pick it up several times later. We file all copies . . . The articles cover everyday problems which are important to me."

It's mighty nice to know that we are doing the kind of job you like.

New Puzzle

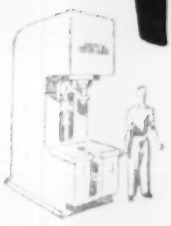
Sam D. Groff, Mexico Refractories Company, Mexico, Missouri says that he goes for the simple puzzles and suggests this as one he found interesting: Sam bought a cow and her calf for $280. A few months later he sold the cow to Al for a 25% profit, and the calf to Al's brother at a 50% profit. Sam originally paid $200 more for the cow than the calf. The question is what did he pay for each of them originally, how much did he sell them for, and what was his profit on each?

Mr. G. says that we will probably consider this one too juvenile, but we will leave that up to you.

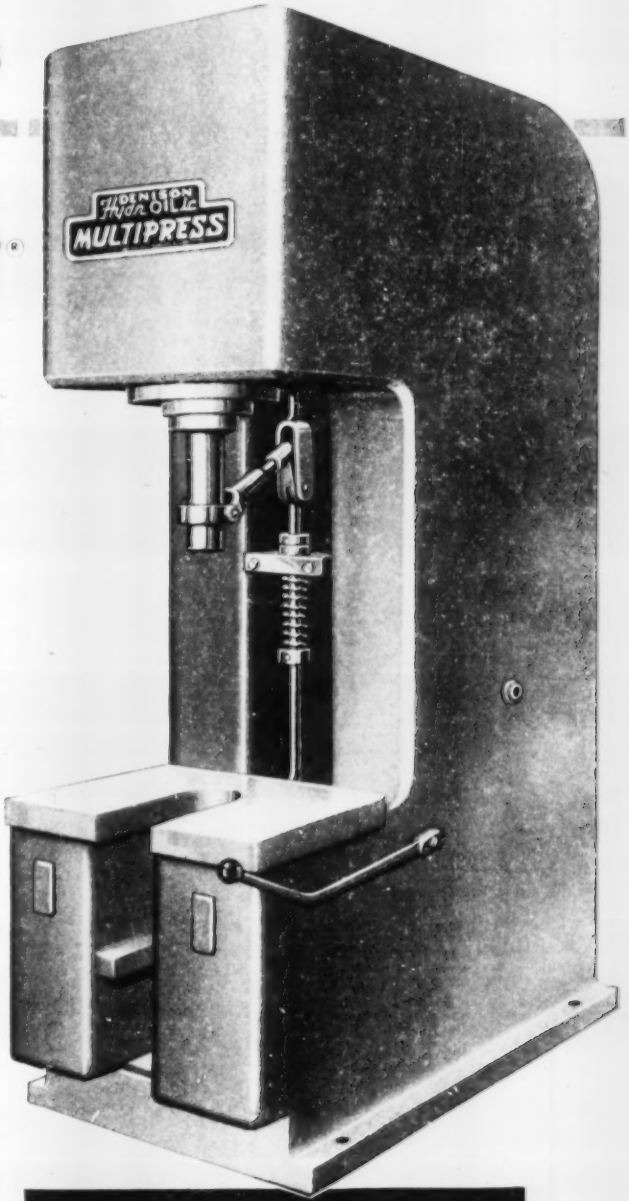
Shrdlu

(Metalworking Outlook—Page 59)

NOW Cost-cutting, servo-type "touch control"



up to 75 tons



With this new and bigger

MULTIPRESS®

you can now have all of the operating advantages of the well-known Multipress line — plus the advantages of the new servo-type Touch Control . . . ***for applications up to 75 tons!***

IDEAL FOR STRAIGHTENING, DIE SINKING, COMPACTION, ASSEMBLY. With this new heavy-duty *Touch Control* Multipress, you can make the ram travel fast or slow . . . stop or reverse it any time . . . hold it at any point . . . bear down on the work with a few pounds of pressure or all 75 tons . . . repeat pressures as rapidly as you can manipulate the hand levers . . . and hold pressure on the work for any needed dwell period.

Touch Control gives the operator a positive, direct "feel" of the operation — adds his own skill to the smooth, dependable accuracy of the Multipress ram. And he gets *instantaneous response* to every action of the hand lever.

Applied pressures are quickly and accurately shown on the dial gauge. Stroke length is fully adjustable at both upper and lower limits. Maximum tonnage can be preset at any pressure within the limits of the press.

The 75-ton Multipress offers a 30-inch daylight opening (or gap) . . . 34-inch work table width . . . 13-inch throat depth . . . and a ram stroke that's fully adjustable up to the 15-inch maximum. Height, only 106 inches. *Write today* for full details on this versatile, big-job Multipress with TOUCH CONTROL.

The DENISON Engineering Co.
1163 Dublin Road, Columbus 16, Ohio

DENISON HydrOILics

GEAR CUTTING
GEAR FINISHING
Complete Equipment
For Gear Production
GEAR LAPPING
GEAR CHECKING
Model 18105 Shear-Speed Cuts
Costs at Caterpillar

ONE SHEAR-SPEED* CUTS CATERPILLAR CLUSTERS

. . . in 1/8 the time!

In ONE HOUR, one SHEAR-SPEED shaper cutter cuts as many teeth on these final drive gear and pinion clusters as were cut by previous methods in EIGHT HOURS at Caterpillar Tractor Co. Less floor space is required, and the Shear-Speed has no trouble keeping up with production requirements. Both gears are cut on the same Shear-Speed.

The blank weighs 70 pounds. 20 pounds of metal is removed in cutting the teeth. Cutting time for the 10.372" diameter, 27 tooth gear is 7.5 pieces floor to floor per hour; the 12 teeth on the 6.097" diameter pinion are cut at the rate of 6.5 gears per hour.

Twenty-one complete gears were produced in 8 hours by previous standard hobbing and shaping methods on 6 machines. Diametral pitches are 2.750 on the gear and 2.413 on the pinion. Face widths are 2 1/16" and 4 3/16".

*Registered Trademark

GEAR PRODUCTION HEADQUARTERS

The Fellows Gear Shaper Company

from blank to finished gear

7171 E. McNICHOLS RD. • DETROIT 12, MICHIGAN, U. S. A.

43% of all businesses shut down by fire are now as extinct as dinosaurs. Records burned, orders destroyed, customers lost. Better protect your business with a KIDDE fully AUTOMATIC CO_2 Fire Extinguishing System.

*according to a survey by the Safe Manufacturers' National Association

The word "Kidde" and the Kidde seal are trade-marks of Walter Kidde & Company, Inc. and its other companies.

Kidde

Walter Kidde & Company, Inc.,
360 **Main Street, Belleville 9, N. J.**

Walter Kidde & Company of Canada, Ltd., Montreal, P. Q.

STEEL Produces Evidence

I have just had time to go through your Annual Yearbook issue and I want you to know that I think it is magnificent. For the past two years this special issue has been in such great demand among our engineers that I feel compelled to double our subscription to STEEL for our Doehler-Jarvis executive offices, our Research & Development Department and our Toledo plants. At the same time I am checking our other plants to see what their needs may be.

I merely mention this because it is concrete evidence of what your book is doing.

E. F. Brissie
director of public relations
Doehler-Jarvis Corp.
Toledo, O.

Sports Cars Are Safe

Just read your "Mirrors of Motordom" column for Mar. 2 (p. 71).

You sound a little panicky. Instead you should be very encouraged and, in turn, I think you should encourage the sports car trend in this country. Perhaps Detroit will eventually ditch a lot of suicidal design work and come up with a SAFE car.

Please don't think I am just another sports car crank. You touched very lightly on a deadly serious subject—the future safety margin of the American automobile. I am writing because I think the sports car holds the answer to a number of things presently lacking in our Detroit product, and needed for greater safety.

I predict the American car of the future will be much smaller, have phenomenal road holding qualities and go from zero to sixty like a hummingbird.

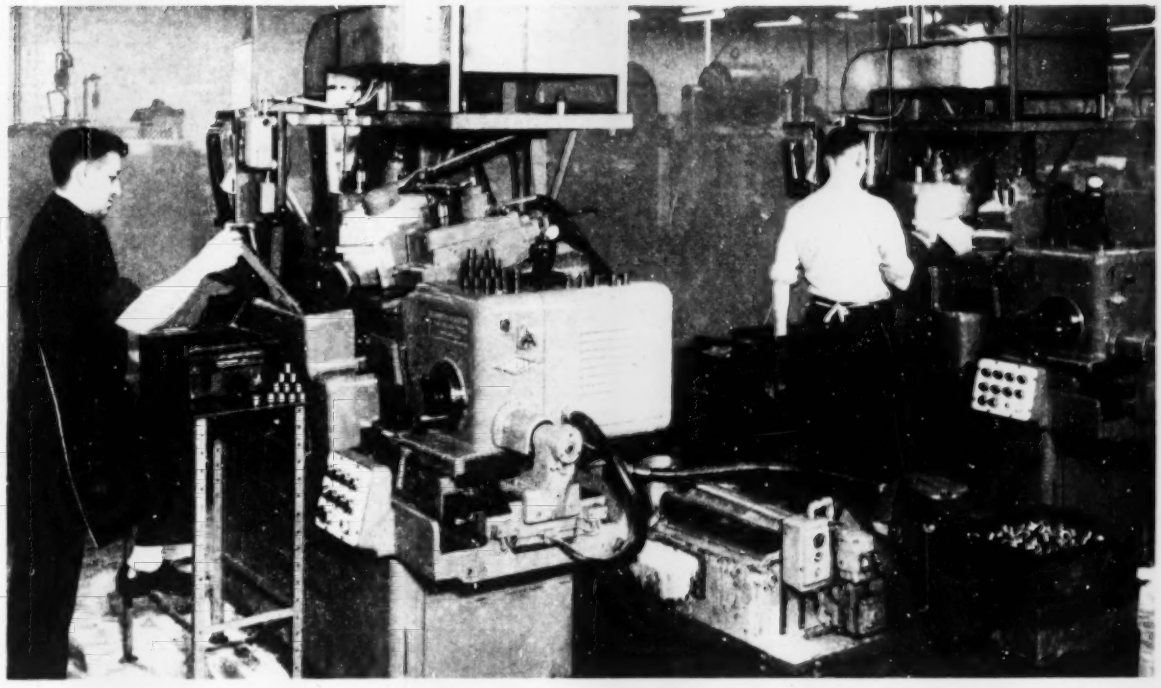
However, if I'm wrong then I and an increasing number of other Americans will go right on buying sports cars in an effort to survive the rigors of the traffic problems of the future rather than just for the sheer fun of driving great cars.

R. C. Nicholson
Master Rule Co., Inc.
Middletown, N. Y.

Added Thought on Change Time

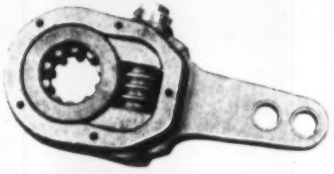
In the article "Cutting Speed: Horizons Limited" (Feb. 9, pp. 88-89), one complete thought was omitted. The first sentence after the subhead "Change Time" should read: "If average time to change cutters and reset machine is 15 minutes, and average time to grind

Continued on following page



5 THREADING PASSES ELIMINATED By LANDIS Centerless Thread Grinders

BENDIX - WESTINGHOUSE in Elyria, Ohio, recently installed two *LANDIS* #1 Centerless Thread Grinders for threading slack adjuster gear worms, used in automotive air brakes. This new threading method resulted immediately in fewer threading operations, fewer rejects, savings in critical materials, and longer product life.



Gear worm blanks are made of alloy steel, heat-treated to a 285-311 Brinell hardness. Former methods had required 7 separate passes to complete the threads. Threads were rough-cut before heat-treating in one pass, then finish-ground in six passes after heat-treating.

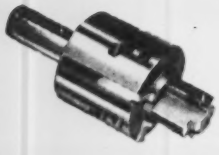
Using the *LANDIS* Centerless Thread Grinders, threads are now completed after heat-treating in *two* operations. Both machines are arranged for "upgrinding", a method developed by *LANDIS*, which allows up to 30% greater work surface speeds while maintaining concentricity and finish. Upgrinding allows deeper cuts, and threads are finished in two passes. For example, on the machine producing 3½ pitch threads on 1¼" gear worms, roughing takes a .108" cut, finishing .089", with 8 pounds of metal removed every hour.

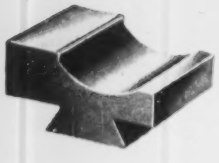
Other important advantages have resulted from the new process. By grinding threads after heat-treating, locked-in stresses are eliminated, and BENDIX-WESTINGHOUSE reports show that product life has been doubled. In addition, a reduction in the number of rejects and the elimination of a nubbing on the workpiece (formerly required to facilitate threading) has effected substantial savings of critical materials.

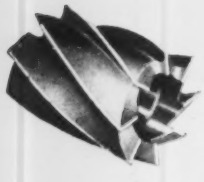
This successful production story can be retold in your plant. Centerless Thread Grinders, built exclusively in the United States by *LANDIS*, are designed for high-speed mass production of screw threads ranging from 1 16" to 4¼" in diameter. Please send specifications when writing for additional information.

THE LANDIS *Machine* CO. 50th ANNIVERSARY **WAYNESBORO PENNSYLVANIA**

with *Gorham*-ENGINEERED SPECIAL CUTTING TOOLS







Next time you're up against a tough tooling problem, call in the man who can give you *the right answers fast* . . . your nearby Gorham Field Engineer! He's an expert in special cutting tools . . . and he's ready to provide a complete engineering service to determine your exact tooling requirements. He starts with your product, sketch or idea. He surveys your production operations and available equipment. He considers work material properties and desired finishes and tolerances. He plots proper machine feed, speed and method of tool driving. Then he develops practical design and engineering specifications for special cutting tools, metallurgically "tailor-made" for your application.

His recommendations are backed by Gorham's unmatched facilities, which include three fully-equipped modern plants, a large Engineering and Metallurgical staff, and a force of field application engineers in principal industrial centers, coast-to-coast. All are dedicated to furnishing prompt and profitable solutions to your special tooling problems. Gorham-engineered "specials" are turning problems into profits in thousands of plants every day . . . why not let them do the same for *you?* If you haven't met your nearby Gorham Field Engineer, write for his name, or send details of your problem direct for recommendations.

Gorham TOOL COMPANY

"EVERYTHING IN STANDARD AND SPECIAL CUTTING TOOLS"

14401 WOODROW WILSON • DETROIT 3, MICHIGAN

LETTERS

Concluded from preceding page

cutters is 30 minutes . . ." instead of "If average time to grind cutters is 30 minutes . . ."

H. J. Deal
Cincinnati Milling Machine Co.
Cincinnati

Be a Better Neighbor

Your Feb. 23 issue is a real accomplishment—a "dilly"! Keep up the good work as it's generally known that you always endeavour to do. If available, I would appreciate 3 to 6 tear sheets of the complete article "How Industry Can Be a Better Neighbor" (pp. 53-60).

Frank J. Norman
G. M. Giannini & Co., Inc.
Pasadena, Calif.

We are interested in obtaining a reprint of the article "How Industry Can Be a Better Neighbor" (Feb. 23, p. 53-60), which is the first of a series of articles on management.

A. Metzger
Heppenstall Co.
Pittsburgh

Another Look at Locks

On p. 69 of your Mar. 2 issue appears a report entitled "Builders Hardware." I should like to call your attention to an error in your discussion of cylindrical locks under the subhead, "New Developments."

In describing the cylindrical lock as a "postwar development" your reporter overlooked the fact that Schlage Lock Co. has been manufacturing such locks for more than a quarter-century. This type of lock construction was conceived and perfected by Walter R. Schlage, whose first patents were filed in 1909. Cylindrical locks have been made and sold in quantity by Schlage Lock Co. since 1924. In recent years, with the expiration of basic patents, the Schlage designs have been widely imitated.

Your report also states: "Only since 1950 has aluminum come into use in locks." Aluminum trim is another development in which Schlage has taken the lead. Employing the Alumilite process, Schlage aluminum locks have been produced in growing volume since the end of World War II.

A. H. Winkler
Schlage Lock Co.
San Francisco

• *Schlage was a pioneer. Both cylindrical locks and aluminum locks were adopted on an industry-wide basis since the war. Most producers are just beginning to realize the extent of aluminum possibilities.—ED.*

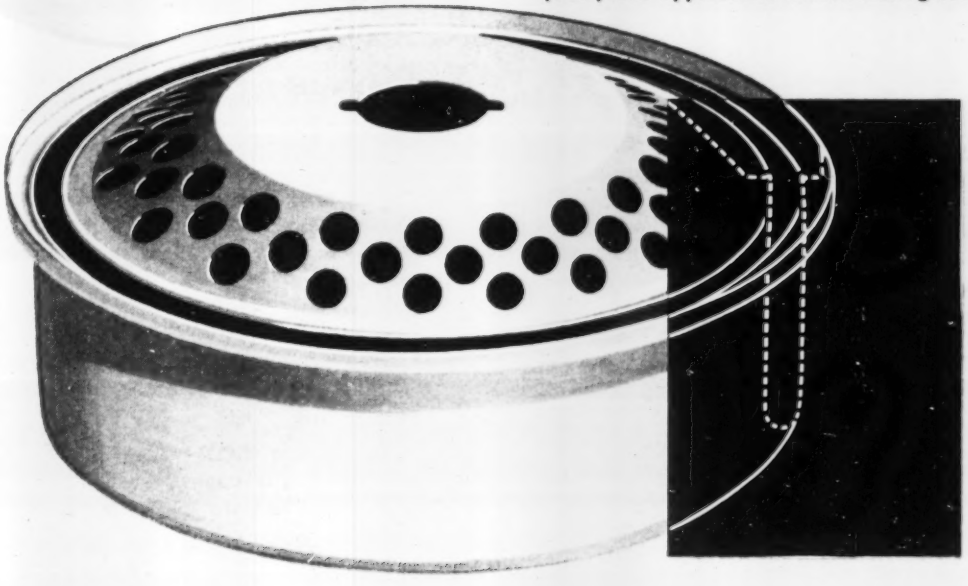
Difficult deep draws... made economically with

Weirzin

ELECTROLYTIC ZINC-COATED STRIP

Leading manufacturers throughout the country have chosen Weirzin for the many fabrication economies it offers. They have found Weirzin especially adaptable to deep drawing and forming because the zinc coating remains intact and of even thickness. It does not peel or flake and forms an impervious protective coating, safe from underfilm corrosion. But the economies that Weirzin offers do not stop here. Beneath the zinc coating is Weirton's cold-rolled steel, noted for ductility and uniformity of gauge—assuring you of ease-of-fabrication with minimum rejects.

When the job calls for difficult deep draws specify Weirzin and get the advantages of better quality and appreciable manufacturing economies.



WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

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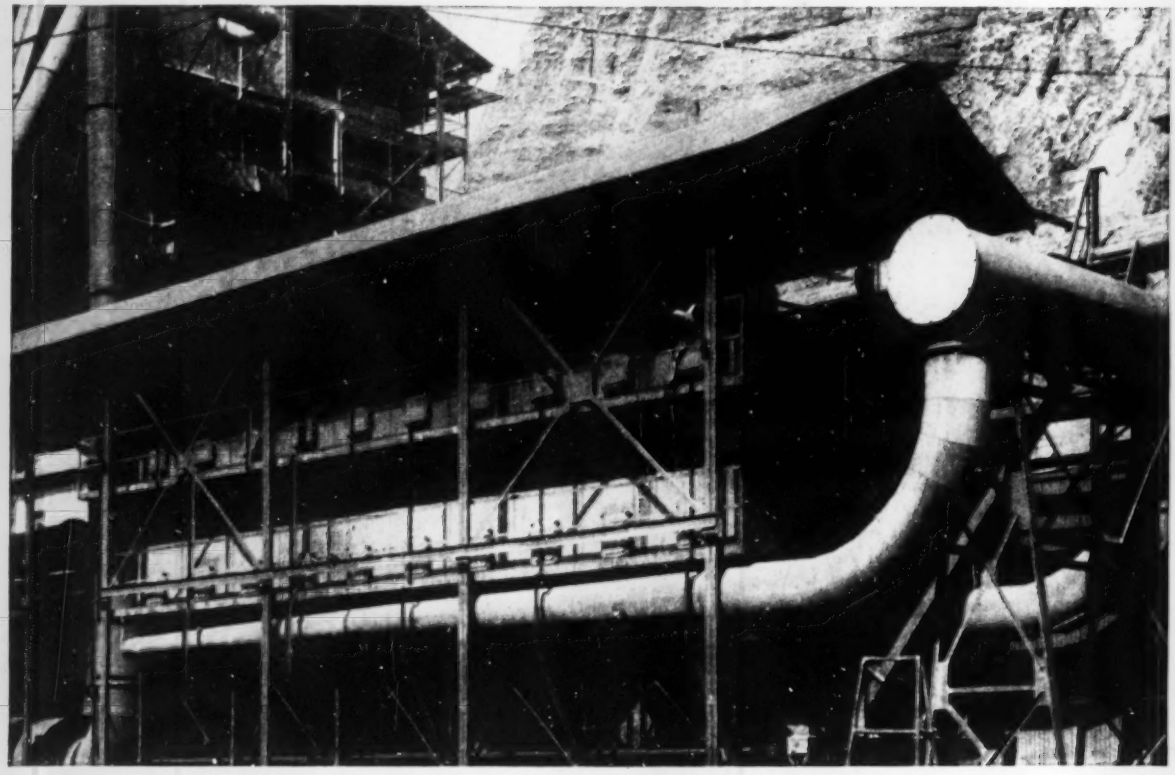
PROVED FOR YOUR JOB...



Typical Dracco installation: Automatic Filters collect toxic arsenic dusts produced in copper refining operations at Cerro de Pasco Copper Co., La Oroya, Peru.

..BY *Thousands* OF INSTALLATIONS

High efficiency and long operating life of industrial dust control equipment depend on two important factors: (1) the dust control experience and engineering "know-how" of the manufacturer and (2) the quality of materials and operating life "built into" the system. Thousands of high-efficiency dust control units and systems designed and built by Dracco furnish operating proof of both these factors.

Thirty-five years' experience devoted exclusively to dust and fume control have provided Dracco engineers with invaluable design, engineering, and operating knowledge. This knowledge has enabled Dracco engineers to solve many dust problems—resulting in substantially improved operating and plant conditions in almost all of the process industries.

When you think of dust control, remember DRACCO—the name, the engineering skill, and the dust control system that will successfully solve your problems.

DRACCO CORPORATION
4090 East 116th Street
Cleveland 5, Ohio

Full information on Dracco equipment as applied to your specific problem may be had by contacting your nearest Dracco representative or Department S-3, Cleveland, O.

DRACCO *Performance Proved*

DUST CONTROL EQUIPMENT · PNEUMATIC CONVEYORS

CAN BROACHING SOLVE SOME OF YOUR PROBLEMS?

LAPOINTE

BROACHING APPLICATIONS

of current interest are fully described on the loose-leaf pages of this portfolio . . . covering such subjects as

- 75 m m Breech Ring
- Transmission Gear Blank
- Disc Turbine Wheel
- 75 m m Pack Howitzer Gun Barrel
- Compressor Rotor Blade for Jet Engine
- Turbo Supercharger Bucket
- Head for Automobile Motor (Valve-in-Head Type)
- Diesel Engine Turbo-Charger Power Wheel with Shaft and Buckets for same
- 20 m m Gun Barrel, 52½" long
- Commander's Cupola
- Tank Tread
- 90 m m Breech Ring

If you are interested in knowing how to broach any of these parts,

WRITE FOR PORTFOLIO # 3

Lapointe, with more than 50 years of experience in designing and building Broaching Machines, Tools, and Fixtures can help you in the above or any other production problem where broaching can be used.

THE LAPOINTE MACHINE TOOL COMPANY

HUDSON, MASSACHUSETTS • U. S. A.

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HUDSON LAPOINTE MASS

THE WORLD'S OLDEST AND LARGEST MANUFACTURERS OF BROACHING MACHINES AND BROACHES

NOW you can

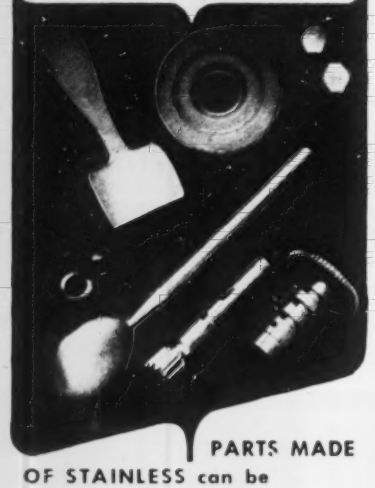
BRIGHT–ANNEAL STAINLESS

on a continuous production basis, with The

SARGEANT & WILBUR

Controlled Atmosphere

CONVEYOR FURNACE



PARTS MADE OF STAINLESS can be

BRIGHT-ANNEALED,

BRIGHT-HARDENED, or

BRIGHT-BRAZED without oxidation . . . they come out scale-free, bright, and clean. No pickling required, no tumbling, no sand blasting.

With our special S. & W. alloy for bright-brazing stainless, the color matches the metal; resists dulling; and the joint is practically invisible. *Gold and silver parts are soldered in the same continuous-production furnace with equal success.*

Your samples processed free. If you want to see some of your own work bright-annealed, bright-hardened, or bright-brazed in a conveyor furnace, send us samples and specifications.

SARGEANT & WILBUR, INC.
180 Weeden St.
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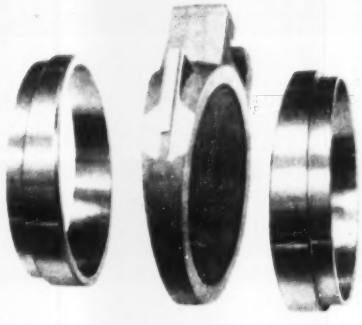
TIME-SAVING IDEAS

Presented as a service to machine shops, we hope some of these interesting ideas, culled from thousands of jobs, will suggest ways to help you cut time and costs in your own metal work.

AN EXCELLENT WAY TO MACHINE GATE VALVE PARTS

No. 12 Hydraulic Lathe Performs 5 Operations with One Set of Tools



Valve seat rings and gate wedges.

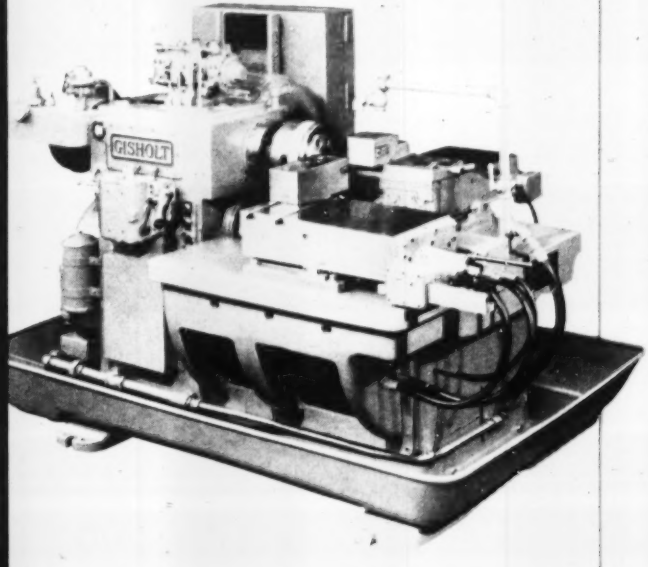
Here is an efficient setup for producing seat rings and slotted wedges for gate valves. A Gisholt No. 12 Hydraulic Automatic Lathe is doing the work on the stainless steel parts requiring close tolerances.

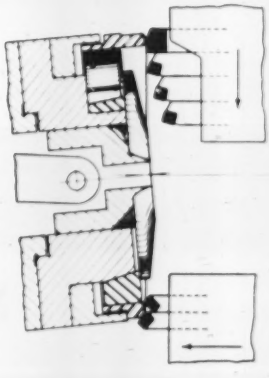
A total of six tools is used to machine the 8" five-degree valve seat rings which are held in a special fixture. Tools on the rear slide rough and finish face while tools on the front slide chamfer inside and outside the seat diameters. The workpiece is held on an air-operated expanding mandrel set at five degrees from the spindle axis. Time is only 3 minutes floor-to-floor.

Changeover for machining the wedges is fast and easy. The same tooling is used and a 2-jaw chuck replaces the fixture. The gates are then machined on one side. To do the next side, the workpiece is reversed. After this operation the part is heat-treated. It is then returned to the No. 12 and light finishing cuts are taken on both sides, leaving a 30 to 40 micro inch RMS finish. Time for each side is 2 minutes. Locating blocks are adjustable and different sizes can be handled with this setup.

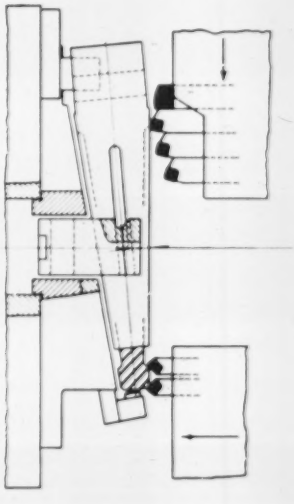
This No. 12 Hydraulic Lathe with its completely automatic cycle, and well planned tooling handles various sizes of two different parts.

The No. 12 Hydraulic Automatic Lathe.





Tooling and fixture for machining seat rings.



Same tooling with 2-jaw chuck for wedges.

GISHOLT

TIME-SAVING IDEAS

TRY THIS TIME-SAVER ON MULTIPLE FACE PARTS

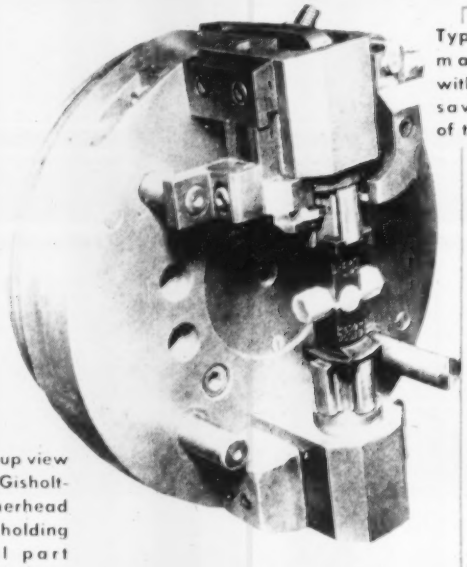
Work is Indexed Without Stopping Spindle

Do you have the problem of machining two or more sides or ends of small parts? The Gisholt-Weatherhead chuck, mounted on a No. 5 Ram Type Turret Lathe, can be your time-saving solution.

This quick-indexing, two-jaw chuck is air-operated. It permits you to index the workpiece *without* stopping the spindle. It's an important time saving feature that means more production per hour, easier work for the operator.

If you machine small to medium size valves, cocks, tees, ells, crosses and similar multiple station parts, you should have full information on the Gisholt-Weatherhead chuck. Ask for the Gisholt Chuck catalog.

Here's a Production Pointer that tells how to machine similar faces of parts without unchucking the part . . . or even stopping the spindle.



Close-up view of the Gisholt-Weatherhead chuck holding small part machined on all four sides.

Typical parts machined with the time-saving help of this chuck.

ON JOBS LIKE THIS POWER AND RUGGEDNESS PAY OFF

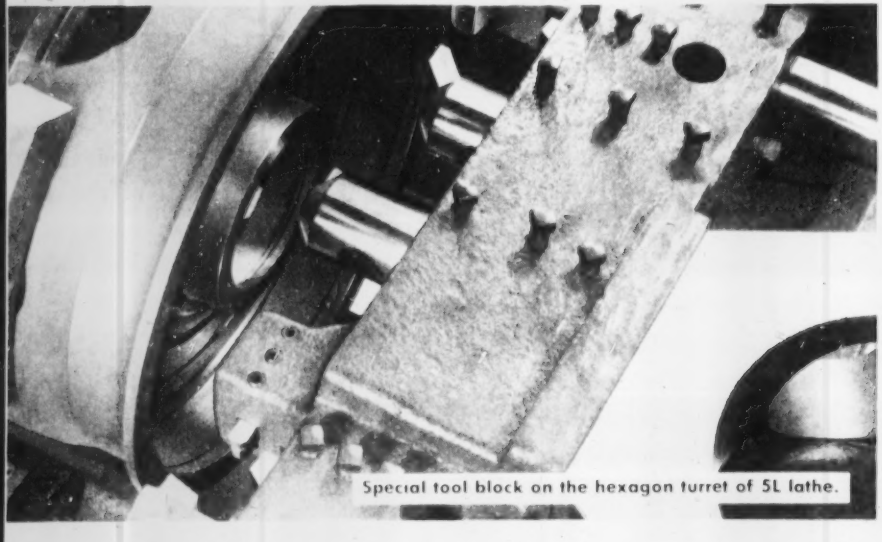
Big Saddle Type Lathe Has Cross Feeding Turret

For hogging off metal on hefty parts, like this heavy steel aircraft engine crankcase section, it takes a machine with plenty of power and rigidity.

This big 5L Saddle Type Lathe with its 56½" swing over the bedways is up to the job on both counts. It's equipped with a 50 H.P. driving motor and has a cross-feeding turret. There's a special tool block mounted on one face of the hexagon turret which feeds into the work and then laterally so that the seven separate tools handle all operations. The rim is turned and faced, two diameters are bored and both OD and ID are rough formed—all in this one movement. Then the tools on the square turret finish form the OD and ID.

It's another case where the sheer power and ruggedness . . . plus combination tooling of a standard Gisholt Saddle Type Lathe . . . pay off on a special job. Once the job is completed, the machine can be quickly tooled for standard turret lathe work.

You should have the Bulletin on the 5L Saddle Type Lathe if your work is of this size. Write; we will also include information on standard tools.



Special tool block on the hexagon turret of 5L lathe.

Seven tools combined on one head plus a sturdy turret lathe give fast production on unusual job.

Tool setup for crankcase job.

GISHOLT

TIME-SAVING IDEAS

2 JOBS—1 MACHINE—1 TOOL SETUP

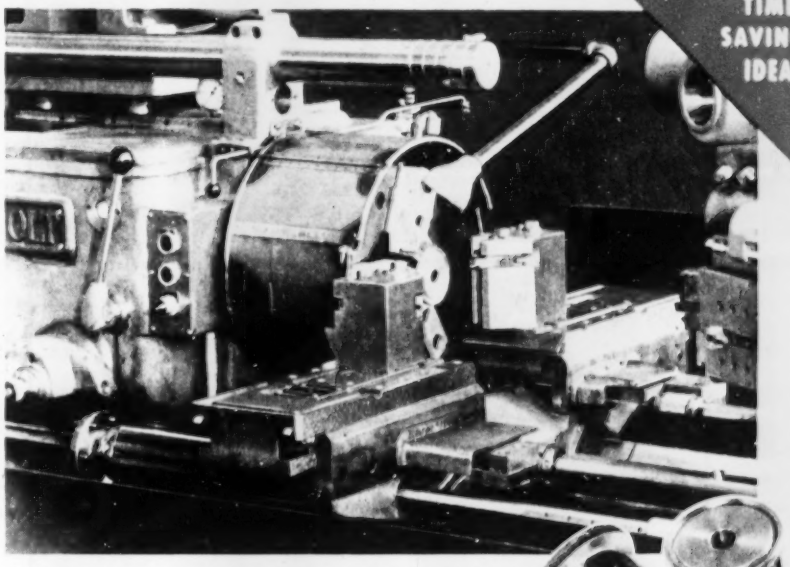
Valve Guide Machining Shows How It's Done

The two operations required to machine these valve guide parts are handled as separate jobs on this Fastermatic Automatic Turret Lathe. Yet, both jobs are done with just *one* set of tools on the hexagon turret.

For the first operation, tools are used in stations 1 and 2 of the hexagon turret. These do rough and finish turning while tools on the cross slides face, form and chamfer. Meanwhile, through the use of the reduced travel feature of the Fastermatic, the rest of the turret stations are by-passed.

For the second operation, the tools which were already set up and inactive in the first operation are now utilized. By merely changing the tools on the front and rear cross slides, the second operation is completely set up. This time tools on the hexagon turret do turning, boring and grooving, while tools on the cross slides face, form and chamfer.

This Fastermatic feature saves setup time and makes changeover fast and simple.



Close-up showing tooling on front and rear cross slides.

There's no re-tooling of the hexagon turret between operations on this job because all tools for both operations are there from the start.

Valve guide before and after machining.

HOW ALL ANGLES ARE COVERED ON THIS FAST SIMPLIMATIC JOB

Adjustable Tool Slides Cope with Different Cone Angles

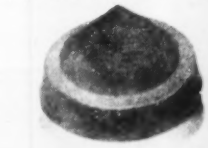
Rotary rock bits for oil well drilling are big business. Here, production is getting a big boost by an excellent setup on a Gisholt Simplimatic Automatic Lathe.

It's handling first and second operations on the three types of bits shown in the drawing. In the first operation, front-slide turning tools turn the various angular outside surfaces. Time: 1.5 Min. f.t.f.

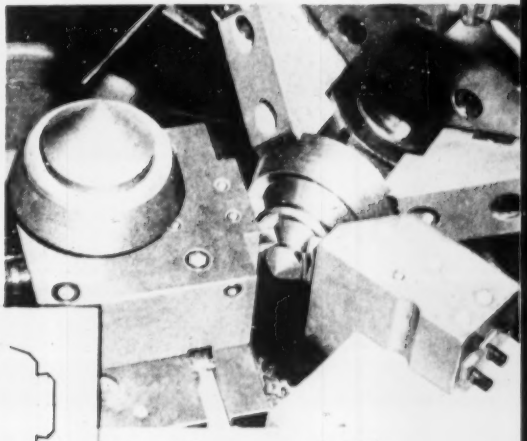
In the second operation, tools on the front and rear slides groove the cutter bits in only .8 minute.

A time-saving feature of the tool slides are their swivel bases which make them adjustable for machining the different cone angles required by the three types of bits.

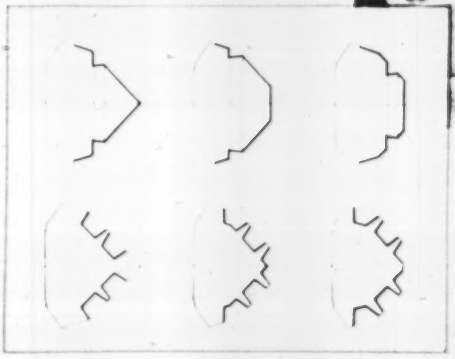
With one set of tools, this Simplimatic handles two operations on three types of rock bits—all having different angles.



Workpiece after first and second operations.



Second operation in machining rock bits.



The 3 types of rock bits.

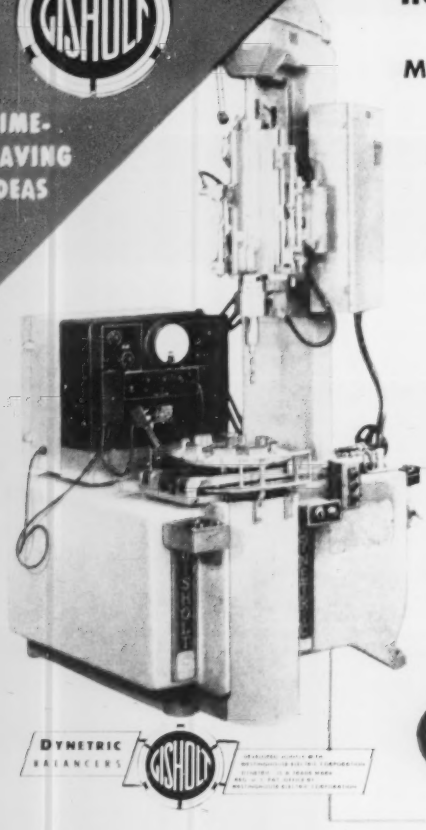
GISHOLT

GISHOLT

TIME-SAVING IDEAS

HOW BALANCING HELPS TAKE THE SHAKES OUT OF TRACTORS

Machine Measures and Corrects Unbalance in Variety of Parts



Balancing does wonders, as this tractor manufacturer has learned. Operation is smoother and vital parts last longer because flywheels and clutch components are precision balanced on a Gisholt 1SV1 DYNETRIC Balancer.

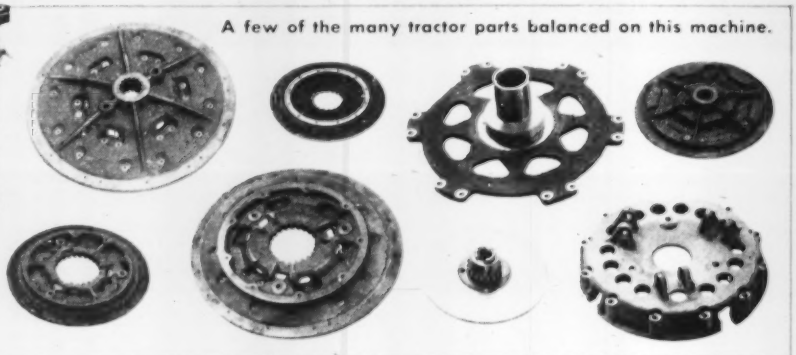
Static unbalance is measured, located and corrected on the one machine. The operator reads the amount of unbalance from the large meter. Correction is then made by the integral-mounted drill which removes the exact amount of metal to bring the part into balance.

This Balancer handles a wide assortment of parts, ranging from 10 to 65 lbs. and up to 21 inches in diameter. Special adapters are used to locate, support and hold each type of workpiece.

For full information on balancing, write for the booklet, "Static and Dynamic Balancing." Also ask for details on Gisholt Balancing School.

Static balancing is a quick, inexpensive operation that gives these tractor parts longer life with less vibration.

A few of the many tractor parts balanced on this machine.



50-SECOND SUPERFINISHING OPERATION—YEARS LONGER BEARING LIFE

Gisholt Model 51-A Cylindrical Superfinisher with workpiece in place.

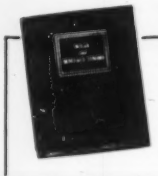
Job Done Automatically

The part you see loaded in this Gisholt Model 51-A Superfinisher is a planetary gear housing. Two bearing diameters, one measuring $3^1/8''$ and the other $1^1/2''$, are being Superfinished.

The two-speed rough-and-finish machine cycle is predetermined, adjustable and fully automatic, except for loading. With the part held by an air-operated draw-back fixture, both bearing diameters are simultaneously Superfinished from approximately 20 micro inches RMS down to 6-8. A special upper oscillating head with two quill units, one standard and the other with 4" vertical travel, clears the workpiece for loading and unloading. Floor-to-floor time is only 50 seconds and production is 57-60 parts per hour at 80% efficiency.

Superfinishing, by ridding the bearing surfaces of smear metal, chatter marks and other irregularities, greatly increases the service life of the parts.

In one fast automatic operation, Superfinishing gives these two bearing surfaces a smoothness that assures much longer life.



The textbook, "Wear and Surface Finish" covers all phases of Superfinish. Your copy is free for the asking.

No. 3-453

607

THE GISHOLT ROUND TABLE represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

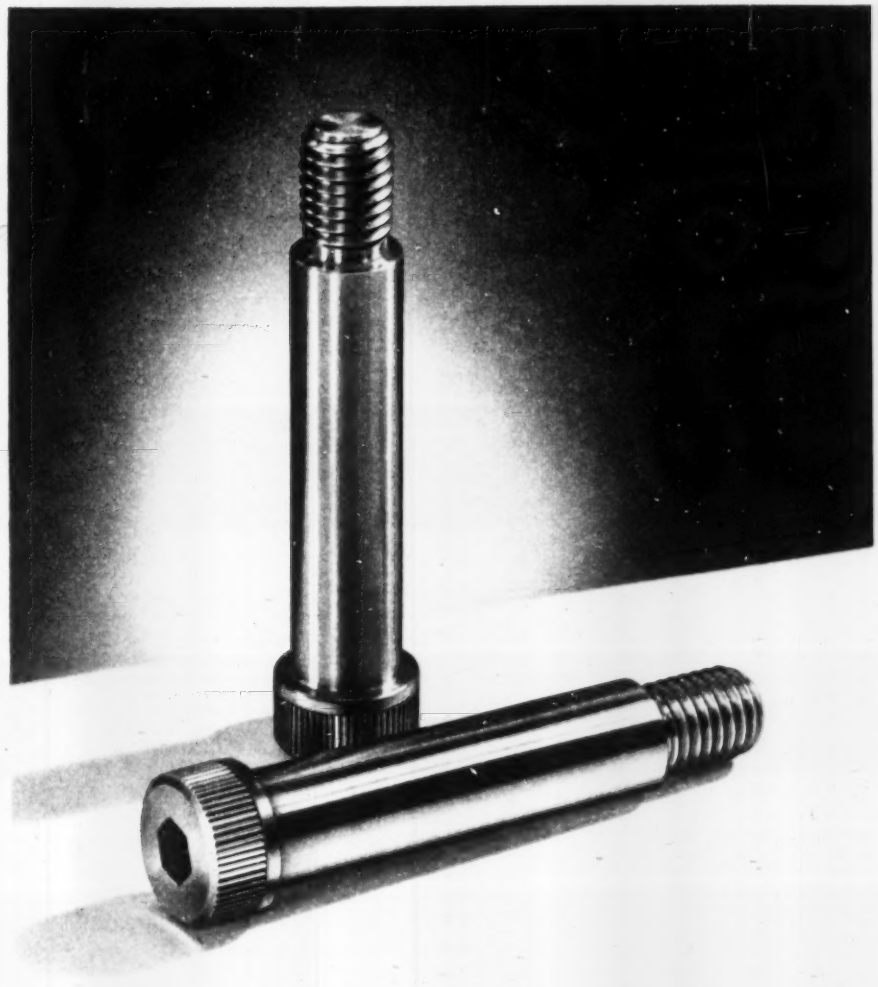
GISHOLT

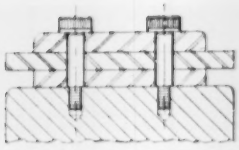
MACHINE COMPANY Madison 10, Wisconsin

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

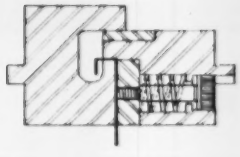
Our Fiftieth Year

A START FOR THE FUTURE

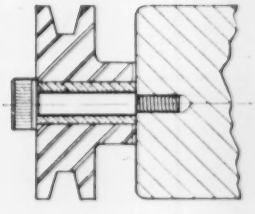




Use UNBRAKO Shoulder Screws as stationary guides and as moving shafts or pivots.



For pressure pad and stripper plate applications.



As stationary shafts or pivots.

UNBRAKO SHOULDER SCREWS have these features: heat treated alloy steel for strength; knurled head for sure finger grip, fast assembly; accurate hex socket for positive internal wrenching; shoulders held to unusually close tolerances; threads and head concentric with body for uniformly accurate assembly; finished threads close to shoulder; fully formed threads, Class 3 fit, standard sizes, ¼" to ¾" in a full range of lengths.

Save time and money, use UNBRAKO standards

Modern methods and quality control produce standardized UNBRAKO socket screw products in large quantities at low cost. A nation-wide industrial distributor organization, which stocks UNBRAKO, assures you excellent service and prompt deliveries. Write for UNBRAKO Standards, a complete listing of standard products stocked by your local UNBRAKO distributor. SPS, Jenkintown 33, Pa.

Write for UNBRAKO Standards

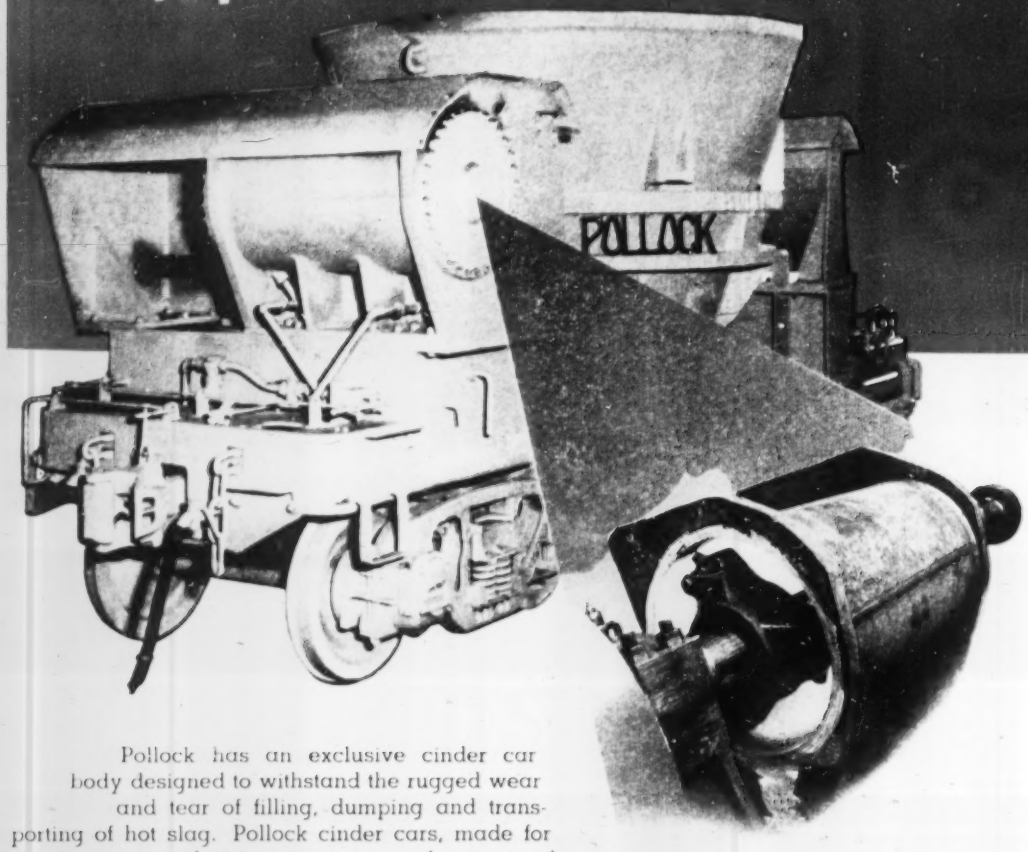
UNBRAKO®

SOCKET SCREW DIVISION

SPS

JENKINTOWN PENNSYLVANIA

meeting POLLOCK cinder cars "specs" requires POLLOCK special facilities



Pollock has an exclusive cinder car body designed to withstand the rugged wear and tear of filling, dumping and transporting of hot slag. Pollock cinder cars, made for air, steam or electric operation, may be arranged to dump from either side. For efficient dumping, Pollock cylinders provide ample power which results from close-tolerance boring and finishing on a special Pollock machine.

This is another example of where Pollock specifications are high because the company has special facilities to meet tough requirements. The major steel plants all over the world use Pollock cars, so why not have Pollock's expert engineers apply their experience to your cinder handling requirements.

This Pollock special machine will bore to close tolerances cylinders from 16 to 36 inches in diameter and up to 4½ feet long.

POLLOCK
Since 1863

THE WILLIAM B. POLLOCK COMPANY
YOUNGSTOWN, OHIO

STEEL PLATE CONSTRUCTION • ENGINEERS • FABRICATORS • ERECTORS
BLAST FURNACES • HOT METAL CARS AND LADLES • CINDER AND SLAG CARS
INGOT MOLD CARS • CHARGING BOX CARS • WELDED OPEN HEARTH LADLES

another reason why owners say —

"We use the VERS-O-TOOL SYSTEM"

They call it a "system" because, among other exclusive features, Vers-o-tools are provided with a patented Namco Micrometer that takes the guess-work out of chaser grinding.

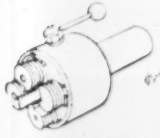
No trial cuts, no adjustments, no time or scrap loss. And by providing an extra set of chasers, kept ground in the toolroom and ready, you put long run jobs on a continuous production basis. Time saved by using this gage frequently adds thousands of precision threads—reduces your costs.

Other Advantages of the System

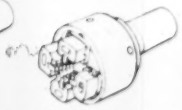
Standard Vers-o-tools use either the famous ground thread circular chasers or the lower cost, adjustable-blade, ground thread chasers—interchangeable die size for die size, in both revolving and non-revolving self-opening heads. The same system applies for end forming and end turning cutters. Use of knurls and rolls is common practice.

Once you start using Vers-o-tools, you are immediately equipped for a more versatile use of threading equipment, at a lower tool investment, than is possible from any other source.

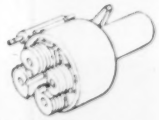
Ask for DT-52, complete new catalog on Vers-o-tool and Namco Solid and Collapsible Taps.



Style DS Vers-o-tool (Non-revolving Type) 10 Sizes, ⅛"—6½".



Style DR Vers-o-tool (Revolving Type) 13 Sizes ⅛"—6½" Shown with Adjustable Blade Chasers 7 Sizes, ⅛"—2".



Style DBS Vers-o-tool (for B&S Automatics) 3 Sizes, ¼"—⅜".

Patented NAMCO MICROMETER takes the guess-work out of chaser grinding

THIS IS THE WAY IT WORKS:

- ★ **Remove chasers from Vers-o-tool head (in one minute) and take a micrometer reading.**
- ★ **Regrind them to the same micrometer reading. (Perfect control of the grind is automatic through serrated mounting of circular chasers—rechecking on the gage proves their uniformity.)**
- ★ **Replace chasers in head (one minute) with *certainty* that they will cut threads *identical* to those cut on previous grinds.**

24-HOUR DELIVERIES ON MOST STANDARD STOCKABLE NC AND NF CHASERS AND BLOCKS — ALSO NATIONAL TAPER PIPE AND DRY SEAL

The NATIONAL ACME CO.

170 EAST 131 STREET, CLEVELAND 8, OHIO.

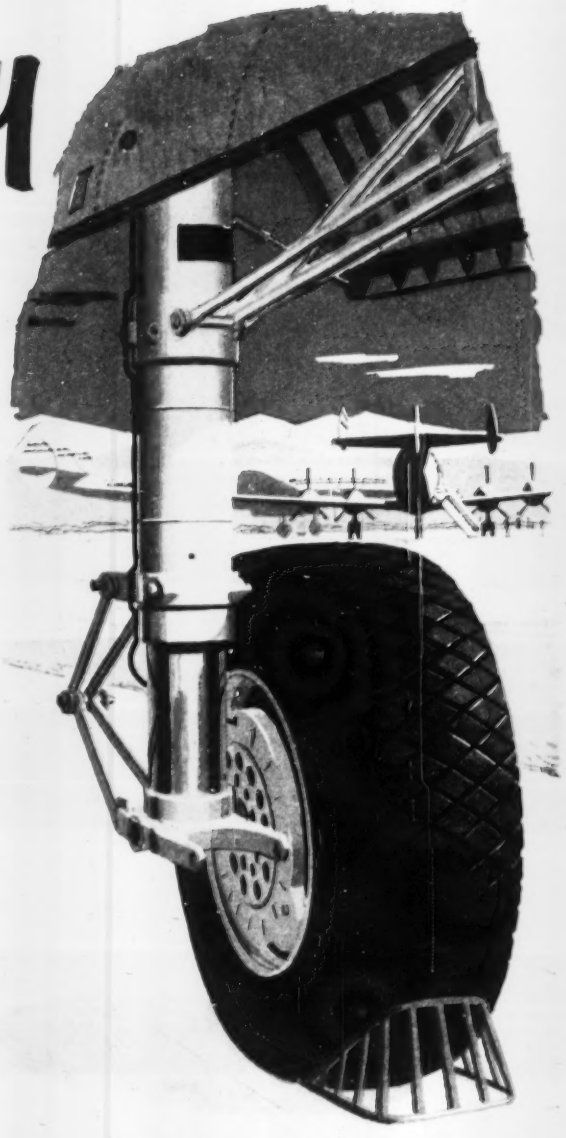
Acme-Gridley Bar and Chucking Automatics, 1-4-6 and 8-Spindle — Hydraulic Thread Rolling Machines — Automatic Threading Dies and Taps — Limit, Motor Starter and Control Station Switches — Solenoids — Contract Manufacturing

Aluminum is Why

Single press stroke saves $10.00 worth of machining

Hogging this landing gear plunger out of bar stock wasted half the aluminum in chips—tied up valuable machine capacity—squandered costly man-hours.

Because even tough aluminum aircraft alloys are ductile and formable, Alcoa engineers and aircraft designers saw the savings possible by impact extruding this part. Today, a slug of tough aluminum alloy is placed in a shallow die—a punch strikes it—the aluminum squirts upward, faster than the eye can follow. Almost instantaneously a plunger is ready for finish machining and assembly—a saving of $10.00 per part.



ALCOA is How

Though impact extruding is not new, it has been confined to simple, cup-shaped parts of workable alloys. But here, a *tough* alloy has been extruded. Nor is the shape simple. It is *thick bottomed, heavy walled* and the open end is flared, all an integral part of the extruding process. Impact extrusions, as Alcoa makes them, compete with almost every fabricating process. Let your local Alcoa Sales Engineer help you explore their possibilities. Aluminum Company of America, 877-C Alcoa Bldg., Pittsburgh 19, Pa.

Alcoa Aluminum

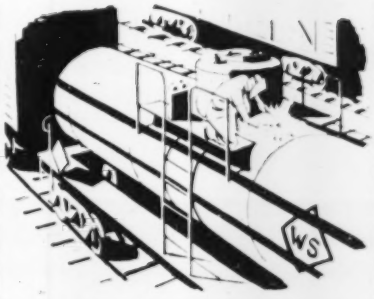
ALUMINUM COMPANY OF AMERICA

This strong, one-piece oil filter housing is an aluminum impact extrusion, produced by Alcoa in a single press operation. Formerly, this part required several operations.

Fabricating this double-wall fuse cap formerly involved an expensive welding operation. Now it is impact extruded by a single press stroke at Alcoa's Edgewater plant.

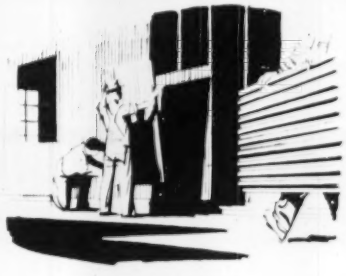
Used in electronic work, this impact-extruded can demonstrates an extreme length-to-diameter ratio which goes far beyond limits formerly believed possible.

Alcoa Aluminum takes all finishes that other metals will take—plus gleaming, rust-resistant anodic coatings which are best on aluminum.



While large structures are usually arc-welded, aluminum assemblies also can be joined by torch welding, all three resistance-welding processes—spot, seam or flash, and brazing.

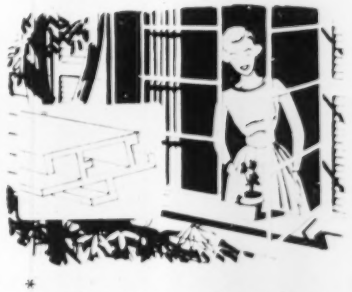
Products marked* are available from your local Alcoa Distributor listed here



* Lightweight, easy-to-handle Alcoa Industrial Building Sheet (only 56 pounds per square) goes up fast . . . reduces dead load . . . stays good looking without painting or finishing.

Corrosion-resistant bearings of Alcoa Aluminum lower diesel maintenance. They are solid metal all through.

Alcoa Aluminum Die Castings can weigh one-third as much as heavy metal castings, yet provide great strength. They are exceptionally easy to machine . . . take all finishes . . . often cost less.



* Almost any shape can be produced as an Alcoa Aluminum Extrusion — hollow, semihollow, solid. Extrusions put the metal where it's most needed, yet use less metal than rolling or fabricating by welding or riveting.

ALABAMA
Birmingham
Hinkle Supply Co.

CALIFORNIA
Los Angeles
Ducommun Metals & Supply Co.
Pacific Metals Co., Ltd.
San Francisco
Pacific Metals Co., Ltd.

COLORADO
Denver
Metal Goods Corp.

CONNECTICUT
Milford
Edgcomb Steel of New England, Inc.

FLORIDA
Hialeah
Florida Metals, Inc.
Jacksonville
Florida Metals, Inc.
Tampa
Florida Metals, Inc.

GEORGIA
Atlanta
J. M. Tull Metal & Supply Co., Inc.

ILLINOIS
Chicago
Central Steel & Wire Co.
Steel Sales Corp.

LOUISIANA
New Orleans
Metal Goods Corp.

MARYLAND
Baltimore
Whitehead Metal Products Co., Inc.

MASSACHUSETTS
Cambridge
Whitehead Metal Products Co., Inc.

MICHIGAN
Detroit
Central Steel & Wire Co.
Steel Sales Corp.

MINNESOTA
Minneapolis
Steel Sales Co. of Minn.

MISSOURI
Kansas City
Metal Goods Corp.
St. Louis
Metal Goods Corp.

NEW HAMPSHIRE
Nashua
Edgcomb Steel of New England, Inc.

NEW JERSEY
Harrison
Whitehead Metal Products Co., Inc.

NEW YORK
Buffalo
Bruce-Mueller-Huntley, Inc.
Whitehead Metal Products Co., Inc.
New York
Whitehead Metal Products Co., Inc.
Rochester
Bruce-Mueller-Huntley, Inc.
Syracuse
Bruce-Mueller-Huntley, Inc.
Whitehead Metal Products Co., Inc.

NORTH CAROLINA
Charlotte
Edgcomb Steel Co.

OHIO
Cincinnati
Williams & Co., Inc.
Cleveland
Williams & Co., Inc.
Columbus
Williams & Co., Inc.
Toledo
Williams & Co., Inc.

OKLAHOMA
Tulsa
Metal Goods Corp.

OREGON
Portland
Pacific Metal Co.

PENNSYLVANIA
Philadelphia
Edgcomb Steel Co.
Whitehead Metal Products Co., Inc.
Pittsburgh
Williams & Co., Inc.

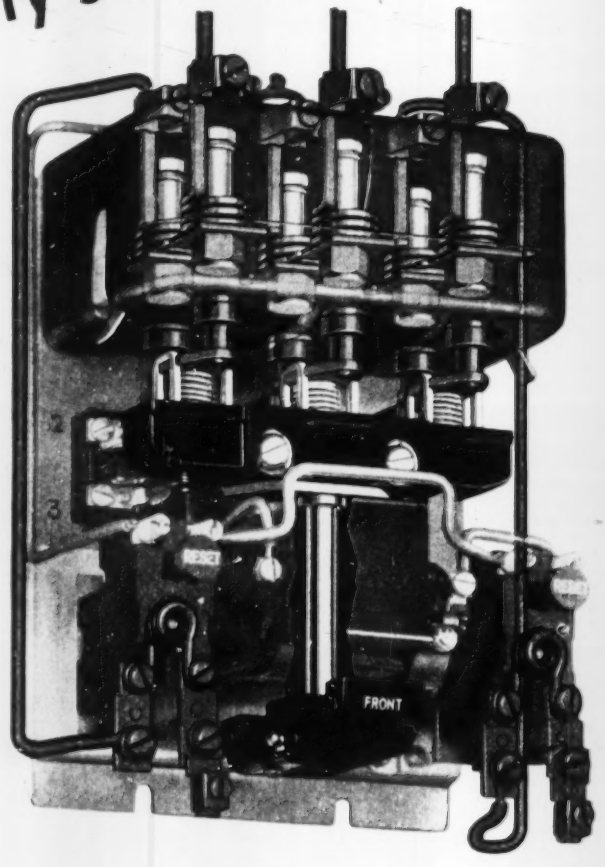
TEXAS
Dallas
Metal Goods Corp.
Houston
Metal Goods Corp.

WASHINGTON
Seattle
Pacific Metal Co.

WISCONSIN
Milwaukee
Steel Sales Corp.

KEEP YOUR EYE

On this Heavy Duty Starter



Phantom view showing complete power circuit

The new CLARK Size 3, Type "CY" Starter, is built for heavy duty operation.

Pioneered and proved in the Size 2, Type "CY", the same principle is now offered to the Size 3.

The design embodies an entirely new concept.

For the first time in electrical control history, strong multi-turn magnetic blow-outs are combined with twin-break controls, in economical space.

Enclosing each arc chamber is a steel case which carries the flux, and is tops in non-carbonizing.

By applying the effect of the blow-out coil concentric with the contact, the arc is quenched.

The most important action is the constant forced rotation of the arc.

This forced rotation prevents the arc from striking repeatedly on the same spot.

This results in minimum contact wear and longer contact life.

Accumulation of ionized gases between the wiring terminals is prevented because the top of the arc chamber is closed.

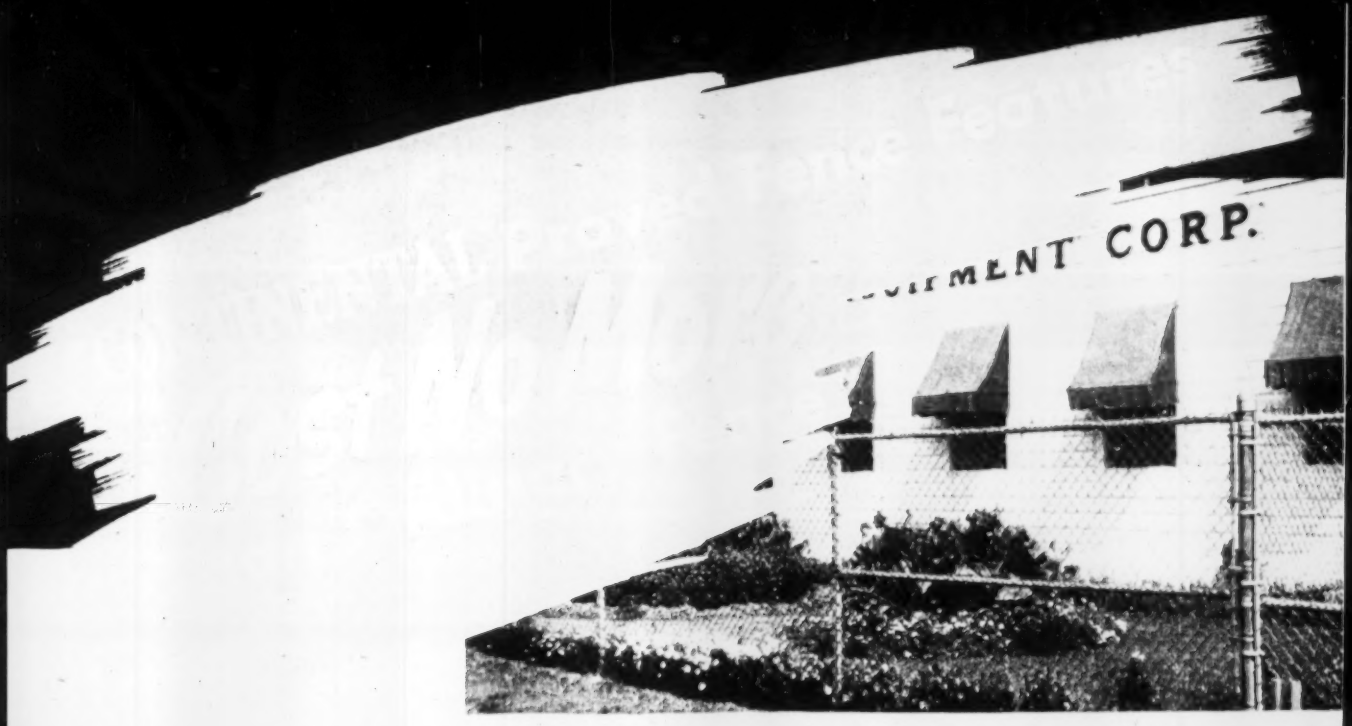
Thousands of CLARK Type "CY" STARTERS are giving satisfactory operation in all types of industry.

By using CLARK Type "CY" STARTERS your control problems can be simplified.

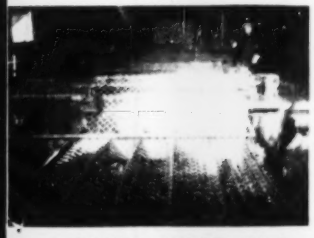
You'd Better Try **CLARK** *type* **"CY"!**

THE CLARK CONTROLLER CO.

ENGINEERED ELECTRICAL CONTROL • 1146 EAST 152ND STREET, CLEVELAND 10, OHIO.



● **"HOT-DIP" GALVANIZED THROUGHOUT**

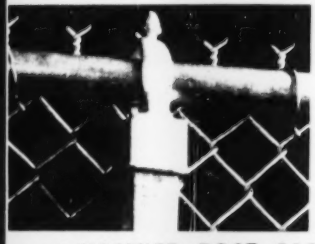


Full gage, high-tensile strength Continental Fence wire is woven into exact mesh, then completely immersed in a temperature controlled bath of molten zinc . . . for a tough, rust-resistant armor coat. Fabric withstands temperature changes . . . retains tension and perfect alignment.

● **H-SECTION LINE POSTS 15% HEAVIER**

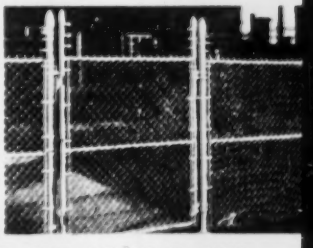
H-section line posts of special analysis copper-bearing steel provides a post twice as resistant to bending at right angles to fence line, where most damage occurs. Tubular corner posts, often exposed to trucks, heavy equipment, furnish maximum resistance in every direction.

● **MORE POST AND TOP RAIL TIES**



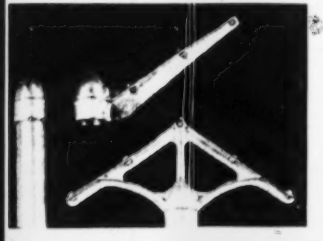
Extra No. 6 gage all-aluminum ties securely hold fabric to fence framework. Special bevel-edge tension band and locking pin eliminates ordinary nuts and bolts for preventing rust. Fittings attached to posts and rails without drilled holes, to maintain maximum structural strength.

● **EASIER OPERATING, ALL-WELDED GATES**



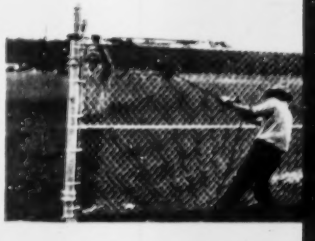
Stronger, neat-appearing construction, with improved pivot-type hinges. Securely braced slide, swing and cantilever gates available. All gates equipped with positive-locking devices suitable for padlocking. Counter-balanced gate-keepers automatically hold gates open.

● **HEAVIER POST CAPS AND ARMS**



Heavily ribbed malleable iron, bullet-shaped caps provide deeper capping for a moisture-proof seal. Combination malleable iron and 12 gage pressed-steel self-locking barb arms are heaviest, strongest obtainable.

● **ENGINEERED AND ERECTED FOR LONGER LIFE**



Continental Fence Engineers help plan and lay out your installation. Line posts are securely set in solid concrete. Tough brace bands, rods and trusses hold Continental Fence in perfect alignment for extra years of worry-free property protection.

You'll Be Glad You Talked With Continental

*TRADE MARK REG. U.S. PAT. OFF.

CONTINENTAL STEEL

CONTINENTAL STEEL CORPORATION

GENERAL OFFICES • KOKOMO, INDIANA

PRODUCERS OF *Manufacturer's Wire* in many sizes, shapes, tempers and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, Lead Coated, and special wire. ALSO, Coated and Uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.

We can learn from bankrupt Micawber

"MY advice, Copperfield, you know. Annual income twenty pounds, annual expenditure nineteen-nineteen-six, result happiness. Annual income twenty pounds, annual expenditure twenty-ought-six, result misery. The blossom is blighted, the leaf is withered—in short you are forever floored. As I am!"

This is probably the most famous financial counsel in all English literature, offered a hundred years ago by Charles Dickens' character the bankrupt Micawber to the hero David Copperfield. As advice it is just as good in 1953 as it was in 1849, and just as sound for a nation as for an individual.

In 17 of the last 20 years, Uncle Sam has followed Micawber's practice, not his advice. Our national balance sheet has been, figuratively, "annual income twenty pounds, annual expenditure twenty-ought-six". Ahead of us as a nation, if we continue this irresponsible policy, is Micawber's dire predicament, "blossom blighted, leaf withered—forever floored".

There is no sane reason why the world's richest nation should continue to live the financial life of a profligate bankrupt. It is time now to set our house in order. The program called for is simple: (1) Eliminate waste and extravagance in government spending; (2) Balance the Federal budget; (3) Control the national debt and reduce taxes.

By such positive action we can protect future happiness—and prevent misery—for ourselves, our children and our children's children.

QUALITY YOUNGSTOWN SERVICE

The Youngstown Sheet and Tube Company

General Offices--Youngstown 1, Ohio
Export Offices--500 Fifth Avenue, New York

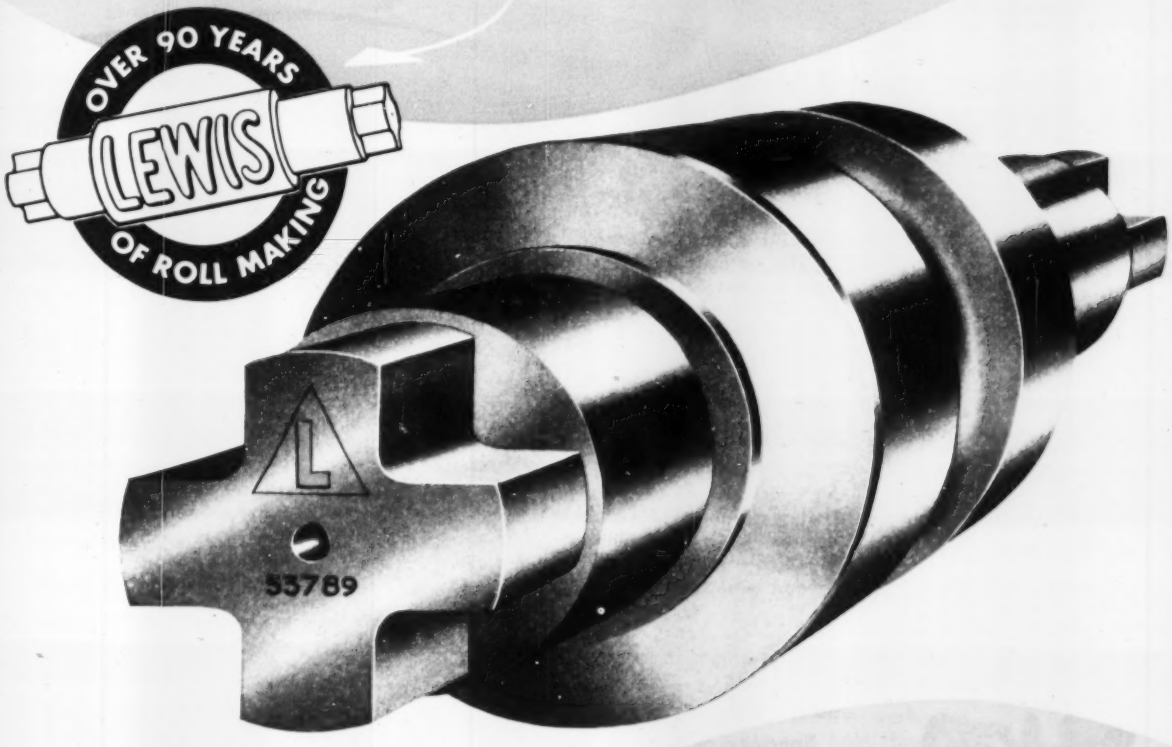
MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

RAILROAD TRACK SPIKES - CONDUIT - HOT AND COLD FINISHED CARBON AND ALLOY BARS - PIPE AND TUBULAR PRODUCTS - WIRE - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - RODS - SHEETS - PLATES.

THE EXPERIENCE and MANUFACTURE OF

LEWIS ROLLS

. . . Known and used wherever metal is rolled



MANUFACTURERS OF
ROLLS AND ROLLING MILL EQUIPMENT
FOR THE IRON, STEEL AND
NON-FERROUS
INDUSTRIES

- SUPERIOR "X" ROLLS
- AJAX DUPLEX ROLLS
- LEWIS "X" AND "XA" ROLLS
- SPECIAL PROCESS ROLLS
- CLIMAX AND AJAX ROLLS
- PLAIN CHILLED IRON ROLLS
- SPECIAL TUBE MILL ROLL
- ATLAS, ATLAS "B" AND ATLAS "X" ROLLS
- MOLYBDENUM CHILLED IRON ROLLS

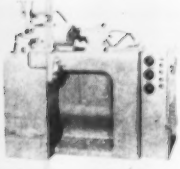
May we have the opportunity of studying your requirements and submitting our recommendations?

ROLLS DIVISION OF BLAW-KNOX COMPANY, PITTSBURGH, PA.

bryant
internal grinding

no. 1309-W

Finishes 2 bores and a taper straight and concentric. 2 wheelheads are used on this semi-automatic. Max. traverse stroke, 6". Max. grinding length, 3½".

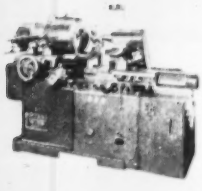


no. 1109

For high production of small bores where accuracy of size and finish are required. Max. traverse stroke, 6". Max. grinding length, 3½".

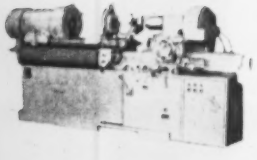
no. 1316

Two wheelheads for high production of jobs requiring face and bore, or face and O.D. grinding. Max. traverse stroke, 20". Max. grinding length, 8".



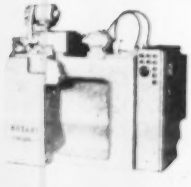
no. 1116

A general purpose hole grinder for tool room, small shop, or general production. Maximum traverse stroke, 20". Maximum grinding length, 8".



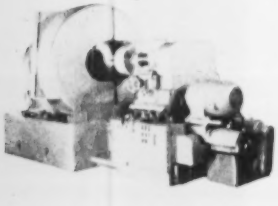
no. 1416

Specially designed for grinding bores in long work, such as machine tool spindles. Maximum traverse stroke, 20". Maximum grinding length, 8".



no. 1209

A fully automatic, high production machine for small and medium bore grinding. Max. traverse stroke, 6". Max. grinding length, 3".

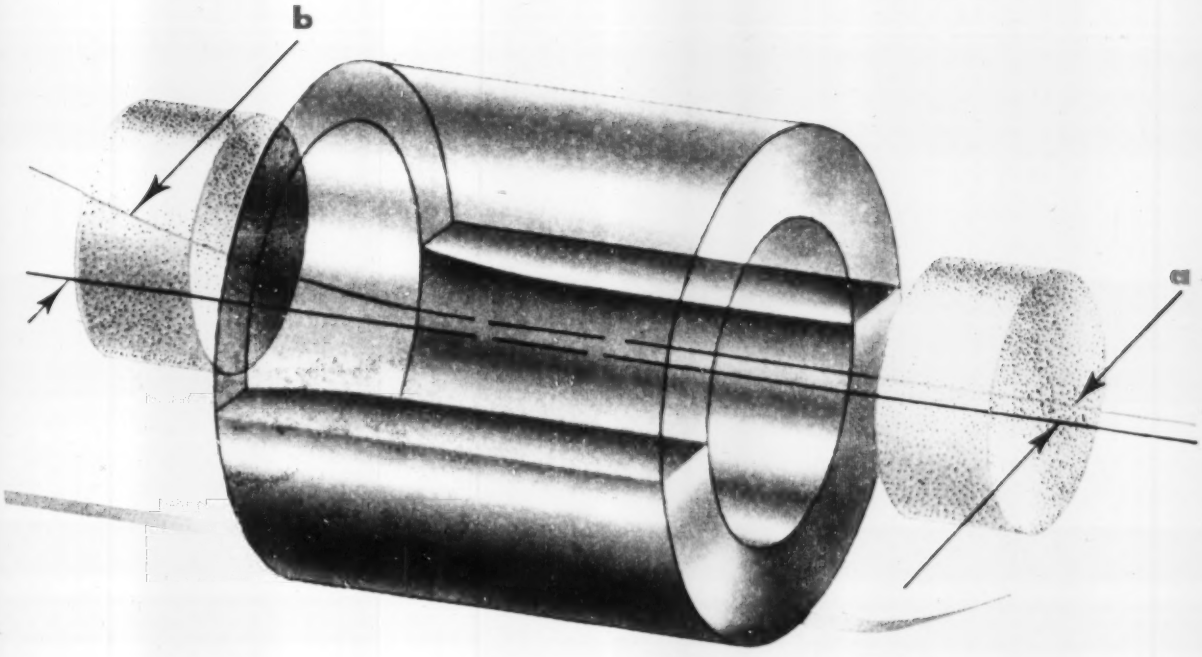


no. 1460

For production or single piece hole grinding on parts up to 60" diameter. Max. traverse stroke, 21". Max. grinding length, 16".

no. 2209

For precision and high production grinding of ball bearing races, gears, rolls, bushings, etc. Max. traverse stroke, 6". Max. grinding length, ¾".



BELL mouth holes are a common internal grinding error. General available information advises simply turning the workhead or changing the length of traverse to correct this error, to generate a straight hole. In the case illustrated above, where bell mouth exists at one end of the hole, neither turning the workhead nor changing the length of stroke will correct this error.

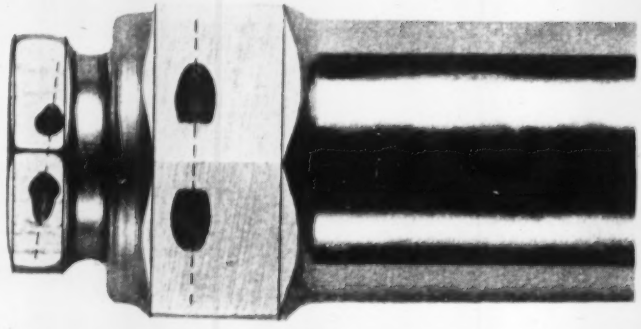
In order to grind a straight hole the wheel must traverse the work in a straight line parallel to the axis of the work. The wheel path (the line in which the wheel traverses) is controlled by the slides under the wheelhead. If the slides are straight and true, the wheel path will be a straight line. If the path of the wheel varies from a straight line, the variation will be generated in the work.

At point "a" the wheel path and axis of the work are parallel and the wheel is set to grind a straight hole. Because of an error in the wheelslide ways, the wheel path is distorted and the wheel is plunged into the back end of the work and the wheel path and work axis diverge as shown at point "b". Wheelslide error can introduce distortion of many types within the work in addition to the one illustrated. The remedy is to correct the wheelslide ways which will, in turn, straighten the wheel path. The wheel contact will be improved, resulting in better finish.

Bryant Chucking Grinder Company
Springfield, Vermont, U. S. A.

Internal grinders • Internal & External thread gages

Is this troublemaker causing headaches in your shop?



(Note that the cross hole drilled on the part to the left — without preliminary spot facing — is on an angle and is not parallel with the face of the part. Further, neither side of the drilled hole is clean. Now compare it to the straight, clean hole on the right, drilled after spot facing.)

Getting the answers to fabricating problems like this is part of doing business with Carpenter!

Isn't it worth a lot to know that the Carpenter Stainless you order is backed by a competent field engineering service to make Stainless fabricating better, easier, more economical? That's the way Carpenter likes to do business! It's one of the surest ways you have to get Stainless fabricating results you've always wanted.

And along with this helpful service, Carpenter brings you the finest Stainless money can buy. Originating in the same mill that invented the first Free-Machining Stainless, it means Stainless that feeds through your machines the same today, tomorrow and a year from now. So for really dependable Stainless backed by helpful shop service, get in touch with Carpenter. THE CARPENTER STEEL CO., 139 W. Bern St., Reading, Pa.

DRILLING CROSS HOLES

Recognize this common troublemaker? It involves drilling cross holes through angular sides of a hexagon head. Some shopmen tell us this job invariably causes them grief from the standpoint of high drill breakage and excessive wear on drill bushings resulting in poorly drilled holes. So one of our stainless service engineers recommended this easy cure: Before drilling, spot face where the drill enters the work. A simple spot facing fixture will do it. In this case the customer's fixture for drilling was O. K. for spot facing and the only tool needed to do this job was a drill ground with a flat end or a regular spot facer. If holes must be exceptionally clean, both sides should be spot faced.

Export Department: The Carpenter Steel Co., Port Washington, N.Y. — "CARSTEELCO"

Carpenter

Free-Machining Stainless

takes the problems out of production

Call your nearest Carpenter Mill-Branch Warehouse, Office or Distributor

don't let CORROSION eat into your profits

Protect precision steel parts during shipment and storage with the proper Gulf Rust Preventive.

From the complete Gulf line of quality rust preventives you can select the proper type to meet your every requirement, such as type of steel, length of time for which protection is desired, conditions of storage or shipment, methods of application, and ease of removal. Ask a Gulf Sales Engineer for additional information. Write, wire, or phone your nearest Gulf office today.

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GULF OIL CORPORATION
GULF REFINING COMPANY
PITTSBURGH 30, PENNSYLVANIA

What's BEST FOR

CARBO

TRADE

"Carborundum" is a registered trademark which indicates manufacture by The Carborundum Company, Niagara Falls, New York

YOU is BEST for us!

You get UNBIASED COUNSEL based on all abrasive methods

Your business, in mass production of parts or finished assemblies, is the problem of generating close tolerance sizes, of producing high surface finishes, of removing stock. The business of CARBORUNDUM is the exclusive ability to recommend and furnish you the specific type of abrasive product which will give you highest quality at lowest cost, on every operation you perform.

Take surfacing, for instance. There are at least 11 different methods of grinding plane or flat surfaces with abrasives. Is your present method the best—the most economical? How can you be sure? Ask CARBORUNDUM . . . for CARBORUNDUM alone has a complete branded line of grinding wheels *and* coated abrasives *and* tumbling and polishing grains. Only CARBORUNDUM can recommend without bias, on the sole basis of what's best for you.

Or perhaps you manufacture table glassware. You can engrave the decorations with a grinding wheel—or you can etch them with high-velocity abrasive grain. You can finish the edges with abrasive belts, or with a grinding wheel. Whatever your method, CARBORUNDUM alone can supply *all* the abrasives you need with *one-source control* of quality . . . quality that's constant, identical, dependable—thus economical.

Several ways to do one operation? Call in CARBORUNDUM. Several processes on one part? Call in CARBORUNDUM. Either way, you win.

Call your CARBORUNDUM *Salesman or Distributor* today!

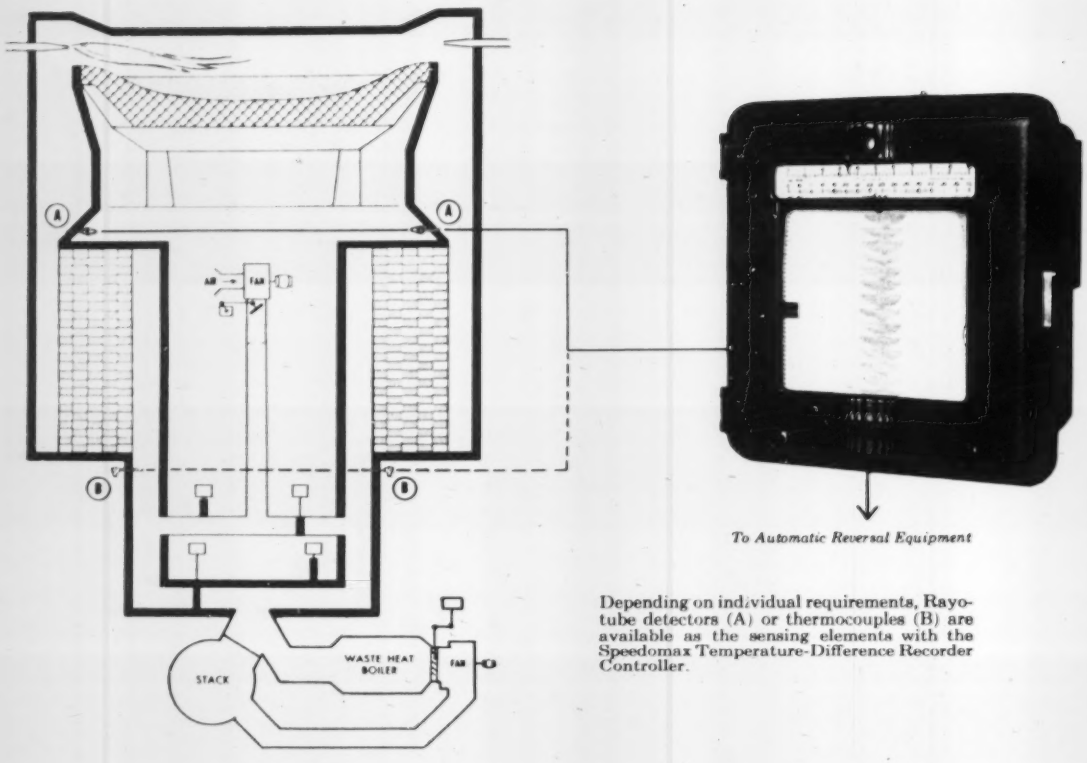
He's your best bet for complete stocks, prompt delivery . . . and best of all, experienced counsel on *every* new development in the *entire* field of abrasives. He's in the yellow pages under "Abrasives" or "Grinding Wheels." Phone him today—it's to your profit!

Ready now—your free copy of the new big COATED ABRASIVE SELECTOR catalog . . . containing detailed recommendations for both machine and hand sanding operations on tough and soft metals, glass, plastic, wood. Phone for it today.

RUNDUM

MARK

. . . the ONLY source for EVERY abrasive product you need



Depending on individual requirements, Rayotube detectors (A) or thermocouples (B) are available as the sensing elements with the Speedomax Temperature-Difference Recorder Controller.

Now...One Instrument Replaces Two

FOR RECORDING AND CONTROLLING OPEN-HEARTH REVERSAL

● Now the recording of checker temperatures and temperature-difference control in Open-Hearth furnaces is automatically accomplished with only *one* L&N instrument. This new Speedomax Recorder-Controller replaces the usual two-instrument arrangement . . . saves panel space . . . increases operator efficiency.

Features Include:

1. Recording of regenerator temperatures with simultaneous measurement of temperature difference.
2. Arrow-type signal lights to indicate direction of firing.
3. Either automatic reversal, or signal for manual reversal, when pre-set difference is reached.
4. An overheat safety feature which automatically reverses checkers at a pre-set temperature limit, regardless of existing temperature difference.
5. Available for use with either thermocouples or Rayotube detectors.

Highly versatile, this instrument can either be used with a complete L&N reversal system, engineered to the exact requirements of the job . . . or can be easily "tied-in" with existing control systems.

This new Speedomax Temperature Recorder-Controller makes possible Open-Hearth reversal with a minimum loss of time . . . assuring a faster heating rate . . . more uniform heat . . . better temperature balance between checkers.

For further information, contact our nearest office or write 4957 Stenton Ave., Phila. 44, Pa.

CAREER OPPORTUNITIES AT L&N

Expansion program of this long-established firm has many features to attract outstanding recent graduates in engineering and science. Opportunities are in sales field engineering, product and application engineering, research, advertising, market development. Widely-respected policies assure recognition of progress and achievement. Address Personnel Manager for an interview at nearest of 17 L&N offices.

Send for free Demonstration Sheets

LEEDS NORTHRUP

Instruments — Automatic Controls • Furnaces

America's finest!

A statement from
a conservative organization:

"Our records show that when a manufacturer once discovers the uniform quality of Roebling flat spring steel, he becomes a steady Roebling customer."

You, too, *pay* for the best spring steel . . . make sure you *get* it. Specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.

S.S. United States . . . most modern, fastest liner afloat.

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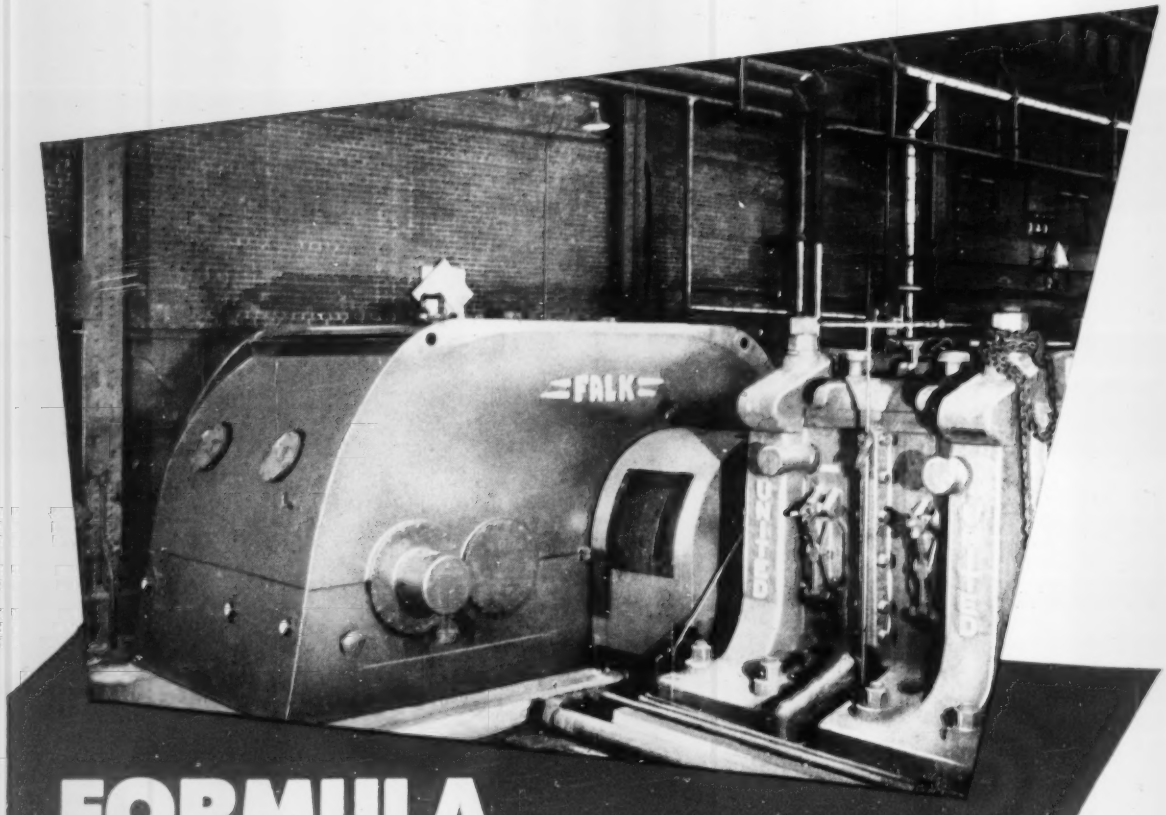


FORMULA FOR LONGER GEAR LIFE

Steel men everywhere have it. You can, too! Use the new and improved *Texaco Meropa Lubricant* in your enclosed reduction gears. This extreme pressure lubricant stands up under heavy loads and tough operating conditions.

In actual service in your gear boxes—you'll find *Texaco Meropa Lubricant* gives longer lasting protection, adds greatly to gear life.

Texaco Meropa Lubricant has outstanding resistance to oxidation. It does not thicken or foam. It will not separate in service or storage, and is non-corrosive to bearings. It has exceptional adhesive qualities and is not affected by moisture.

On open gears, get similar protection with *Texaco Crater X Fluid*. In oil film bearings on back-up rolls, use *Texaco Regal Oil*. This heavy duty, turbine-quality oil resists oxidation and sludging, keeps systems clean.

Let a Texaco Lubrication Engineer help you to greater efficiency and economy throughout your mill. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Meropa Lubricants

FOR STEEL MILL GEAR DRIVES

TUNE IN . . . TEXACO STAR THEATER starring MILTON BERLE, on television Tuesday nights. METROPOLITAN OPERA radio broadcasts Saturday afternoons.

STEEL

The Metalworking Outlook

March 23, 1953

Arms Stepup Coming

Watch for an early expansion in military procurement. It will result from a new sense of urgency arising in Washington from criticism about gaps in arms production, shortages of ammunition in Korea, Stalin's death and attacks on American planes by the communists. Businessmen's teams which have been studying defense needs in European and other countries will report their findings to Mutual Security Director Stassen this week. Needs of our own services are being reviewed. Expected is desk thumping and possibly house cleaning in the Pentagon.

Taft-Hartley! Ho-Hum

Hearings on Taft-Hartley act revisions will start Tuesday before the Senate Labor & Welfare committee and will continue for about six weeks. Senator Taft expects some 15 amendments eventually will be approved by Congress. Mostly they will affect procedure; no drastic changes are expected. Chairman McConnell of the House Labor committee favors retention of the injunctive process in the law but is urging alternative methods to induce settlements in national emergency strike situation. Idea is to keep parties guessing which process would be used.

Building Outlook Good

Construction engineers believe any future cuts in defense spending will not adversely affect building. Defense construction is a relatively small portion of total security spending and if stopped entirely would not have a marked effect on the economy. Lifting restriction on critical materials and manpower will permit retarded programs for schools, streets, institutions and other public works to accelerate and offset any loss in defense construction.

Progress in Willys-KF Talks

San Francisco banking interests report merger discussions between Willys and Kaiser-Frazer are making progress. A better value on Willys stock than was first proposed is being worked out. If the merger is consummated, San Francisco banks will play a major part in the financing arrangements.

RFC To Go

The White House virtually has decided to abolish the Reconstruction Finance Corp. by the end of the year. Chief question now is whether to kill RFC by executive order or to let Congress do it. A movement is under way to drop all other government nondefense lending agencies, estimated to represent a total lending power of $20 billion a year.

Budget Outlook Brighter

Prospects for balancing the national budget now look a little better than they did on the basis of Budget Director Dodge's preliminary estimates. Senator Taft believes $4 billion can be cut from the Truman budget and this may be enough to balance, provided taxes are

Production Engineering News p. 75 The Market Outlook p. 125

not reduced. The first Eisenhower budget is expected to be sent to Congress by May 1 and will contain the administration's fiscal 1954 spending estimates.

No Cut in Taxes

Expect no tax reductions this year. Administration belief that the budget must be balanced first is firmer. President Eisenhower is taking a definite stand against dropping the excess profits tax, although its name may be changed. Defense will be one department that will largely escape the economy ax. Other departments are facing 15 per cent reductions.

Unify Aircraft Specs

A major source of aircraft industry confusion caused by differing format and presentation of requirements will be eliminated through adoption of a new military specification, Mil-I-6252, embodying a common set of instructions for the preparation of specs for Army, Navy and Air Force aircraft.

More Stockholders

Steel companies' stockholders are increasing more rapidly than employees in spite of the industry's vast expansion. Forty-nine major companies have 700,000 stockholders, an increase of 160,000 since the end of the war. Two-thirds hold fewer than 100 shares.

Straws in the Wind

Pennsylvania Railroad will build a million-dollar ore pier at Baltimore to handle imported ores; road is asking Interstate Commerce Commission for higher freight rates from pier to inland points . . . Railroads will file petition this week to make permanent freight rate increases authorized last April and scheduled to expire Feb. 28, 1954 . . . Sufficient nickel to relieve unusual hardships will be diverted to the electroplating industry in the second quarter . . . Brazil has agreed to lower its duty on electrical equipment manufactured in the United States . . . Governor Fine of Pennsylvania is calling for a state FEPC measure following a report by a 14-member committee that 90 per cent of Pennsylvania employers are discriminating against one or more minority groups.

What Industry Is Doing

Labor news will make fewer headlines in 1953 as both the unions and employers proceed with caution in labor negotiations (p. 47) . . . The demise of price controls probably won't bring a flurry of price hikes, only minor adjustments (p. 49) . . . The excess profits tax weighs heavily on young companies struggling to expand (p. 50) . . . Sales of conveyor and transmission belting should continue to roll fast throughout 1953 (p. 51) . . . A new chemical process for nickel plating requires substantially less of the scarce metal (p. 52) . . . Italian steel producers are wondering if they can cut costs to meet the competition of other European producers (p. 57) . . . Aluminum fabricators and distributors can expect the squeeze on the metal to ease considerably; aluminum production by June, 1954, may reach 1.65 million tons—or ten times the 1939 level (p. 58).

PUTTING *Air* TO WORK FOR EASTERN INDUSTRIES

Machined surfaces flat to one light band—that's one millionth of an inch—are made possible the year 'round by Westinghouse air conditioning.

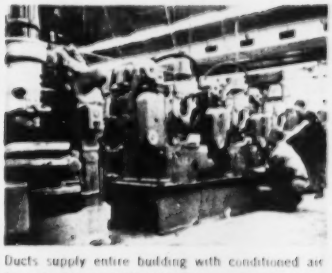
CONDITIONED AIR

HELPS WIPE A WINDSHIELD AT 30,000 FEET

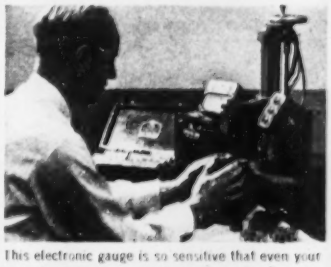
This midget motor-pump sprays a grease-removing solvent onto aircraft windshields. Another provides ground-level conditions for air-borne radar in the stratosphere. Eastern Industries *mass produces* both, but with *tool-room precision.* Critical dimensions are held to plus or minus 25 millionths of an inch! That just isn't possible in hot, humid air.

The answer? Westinghouse-conditioned air maintains plant-wide, controlled atmosphere for such exacting machining, assembling, testing and inspecting. Air conditioning and air cleaning assure a constant temperature and humidity the year 'round, help guard against the dirt, rust and corrosion that will upset delicate gauges or mar super-finished surfaces.

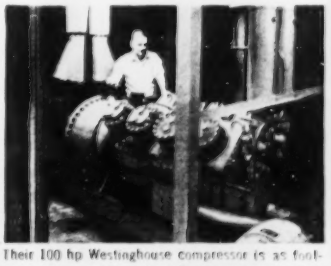
Your product, processes and employees will do better in Westinghouse engineered air. Let us help you *put air to work* for more production, higher quality or improved methods. Check the Yellow Pages for your local Westinghouse Air Conditioning Distributor, or write Westinghouse Electric Corp., Air Conditioning Division, Hyde Park, Boston 36, Massachusetts.



Ducts supply entire building with conditioned air for precision work like this gear cutting operation.



This electronic gauge is so sensitive that even your body heat can cause deflections in its readings.



Their 100 hp Westinghouse compressor is as foolproof as your refrigerator, will give years of service.

YOU CAN BE SURE...IF IT'S

Westinghouse

J-80248

Armco ALUMINIZED Steel

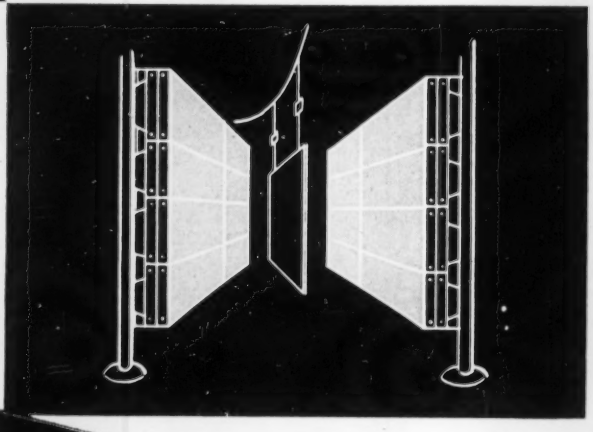
solved this reflector problem

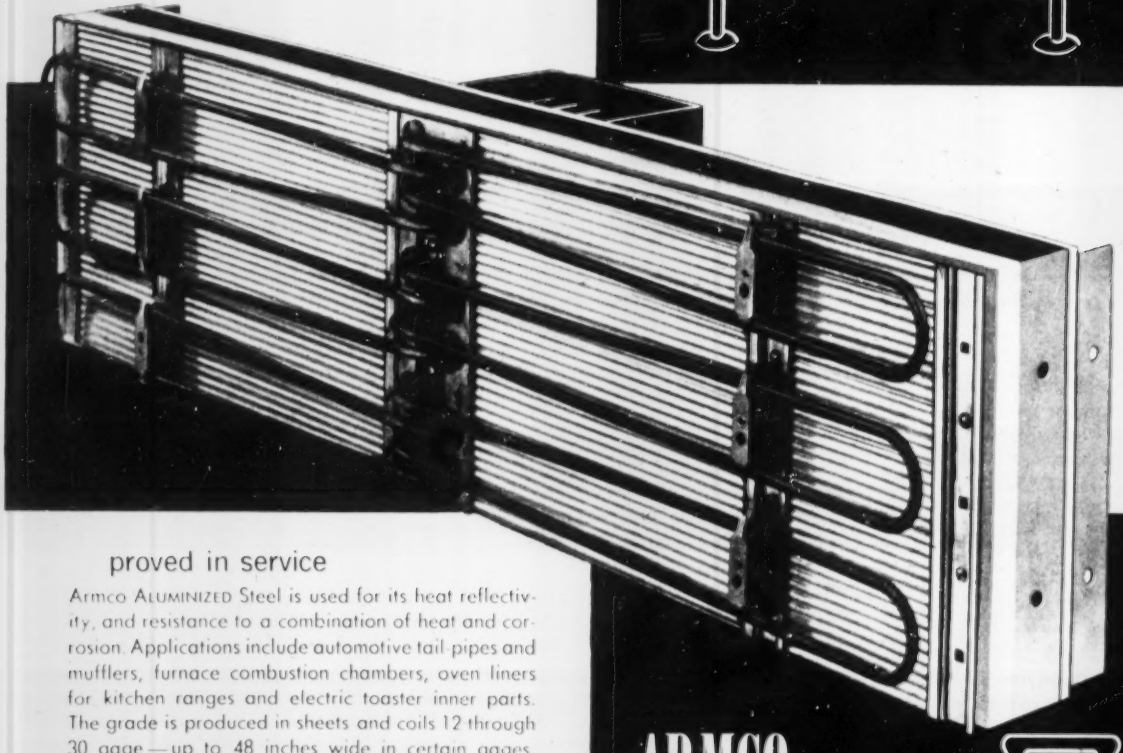
Heating panels for intense infra-red radiant heat need reflectors that are efficient, long-lived and rugged. A prominent manufacturer of electric radiant panel units has found that Armco ALUMINIZED Steel meets all of these requirements.

His reflectors operate on a wave length of 4 microns at 900 degrees F. Even at this temperature the aluminum coating stays bright. It maintains its reflective efficiency because of its resistance to oxidation, and protects the steel base.

the steel base means strength

In addition to their excellent heat-reflectivity, panels made of Armco ALUMINIZED Steel assure rugged strength. Corrugations in the steel give rigidity to "take" hard knocks and vibration at the 900-degree F reflector operating temperature.





proved in service

Armco ALUMINIZED Steel is used for its heat reflectivity, and resistance to a combination of heat and corrosion. Applications include automotive tail pipes and mufflers, furnace combustion chambers, oven liners for kitchen ranges and electric toaster inner parts. The grade is produced in sheets and coils 12 through 30 gage—up to 48 inches wide in certain gages.

write us

If you need a heat-reflective or heat-resistant metal, write us for the descriptive booklet, "Armco ALUMINIZED Steel."

ARMCO
STEEL CORPORATION
1523 Curtis St., Middletown, Ohio • Export: The Armco International Corporation

End of a Hoax

Among accomplishments for which the Eisenhower administration can take credit is the removal of wage and price controls well in advance of the expiration date of Apr. 30. Control of wages was abandoned weeks ago. Jettisoning of price regulations was achieved in seven steps, the first occurring Feb. 7 and the last on Mar. 17.

As a result of this rapid dismantlement of two unpopular bureaucratic controls, the nation again is free to conduct its business under the familiar laws of supply and demand. It is too early to say with certainty what the immediate effect on prices will be, but there is nothing on the horizon to indicate general, across-the-board increases. It is more likely that price revisions will consist chiefly of adjustments up or down to bring certain commodities into line.

However, before saying "good-bye" to wage and price controls it may be well to recall some aspects of this latest experiment with federal manipulation of wages and prices. The clamor for ceilings arose as a result of panic buying following the invasion of South Korea in June, 1950. At first, President Truman turned thumbs down on power to control wages and prices, but Congress, under terrific pressure from powerful union leaders and others, enacted standby legislation.

A strong feeling existed in Washington at the time that if there were to be ceilings on prices, there must also be ceilings on wages. Thus, early in 1951 the Wage Stabilization Board and the Office of Price Stabilization began to function. Almost from the start it became evident that the true motive of the Truman administration in directing WSB and OPS was not to hold down or even stabilize wages and prices but to use these agencies largely for manipulating wages and prices to suit the demands of union leaders. WSB virtually became a wage accelerating board and OPS was merely a tail to its kite.

Our sorry experience with this gigantic hoax should teach us a lesson that never should be forgotten: Never invoke wage and price controls unless they are really needed. Administer them only for the purpose intended.

E. C. Shaner

EDITOR-IN-CHIEF

ALUMINUM'S FAST PACE: One of the spectacular developments of the past decade has been the remarkable growth of the aluminum industry. This year production of the light metal will exceed that of copper, meaning that aluminum ranks second only to steel on a tonnage basis.

At the outbreak of war in Korea (pp. 58-59),

there were three American producers of primary aluminum—Alcoa, Reynolds and Kaiser. Today there are seven, the newcomers being Anaconda, Olin, Harvey and Wheland. Whereas primary capacity totaled 730,225 net tons in June, 1950, by June, 1954, it will be 1,650,550 net tons—a gain of 126 per cent in four years.

This marked increase in tonnage is stimulating a tremendous expansion of fabricating operations. During World War II there were only 36 producers and 15 distributors of wrought aluminum products, such as sheet, foil, wire and cable and extrusions. Today there are 137 producers and 193 distributors. It is estimated that 20,000 companies and over a million persons are engaged directly or indirectly in fabricating aluminum.

While war and defense demands have given great impetus to the aluminum industry, it is steadily developing profitable new civilian markets for its products.

* * *

BOON FOR INSTRUMENTS: Last Tuesday by way of newspapers, radio and television, millions of Americans became somewhat more familiar with what to expect from an A-bomb. Those who studied some of the detailed accounts of the test in the Nevada flats must have been impressed with the extent to which the scientific personnel relied upon instruments.

"Industrial Research Newsletter" reports that the business of radiation instrument manufacture has increased during the past five years from practically nothing to a $20 million-a-year enterprise. Atomic Energy Commission estimates that 80 companies employing 2400 persons are engaged in the business. Half of the instruments are purchased by AEC and military agencies. The other half goes to industry, hospitals, research laboratories, prospectors and mining companies. The private market is expanding encouragingly.

* * *

EFFECTIVE ROAD BLOCK: As usual, the annual report of the United States Steel Corp. invites careful perusal because of the wealth of operating and financial detail it presents. One chart alone, "Tons Shipped vs. Income Earned," is challenging in its implications.

For one thing, income earned—whether measured in 1940 or current dollars—seldom bears any relation to tons of product shipped. In 1944, when shipments were the highest in U. S. Steel's history to that date, income was next to that of the lowest income year of World War II. In 1952, when tonnage shipped was slightly higher than that of the peak war year (in spite of the 2-month strike), income in 1940 dollars was way below that of 1940 when shipments were much lower.

U. S. Steel's figures show how effectively ill-advised government policy has placed a road block against the efficient operation of basic industry.

* * *

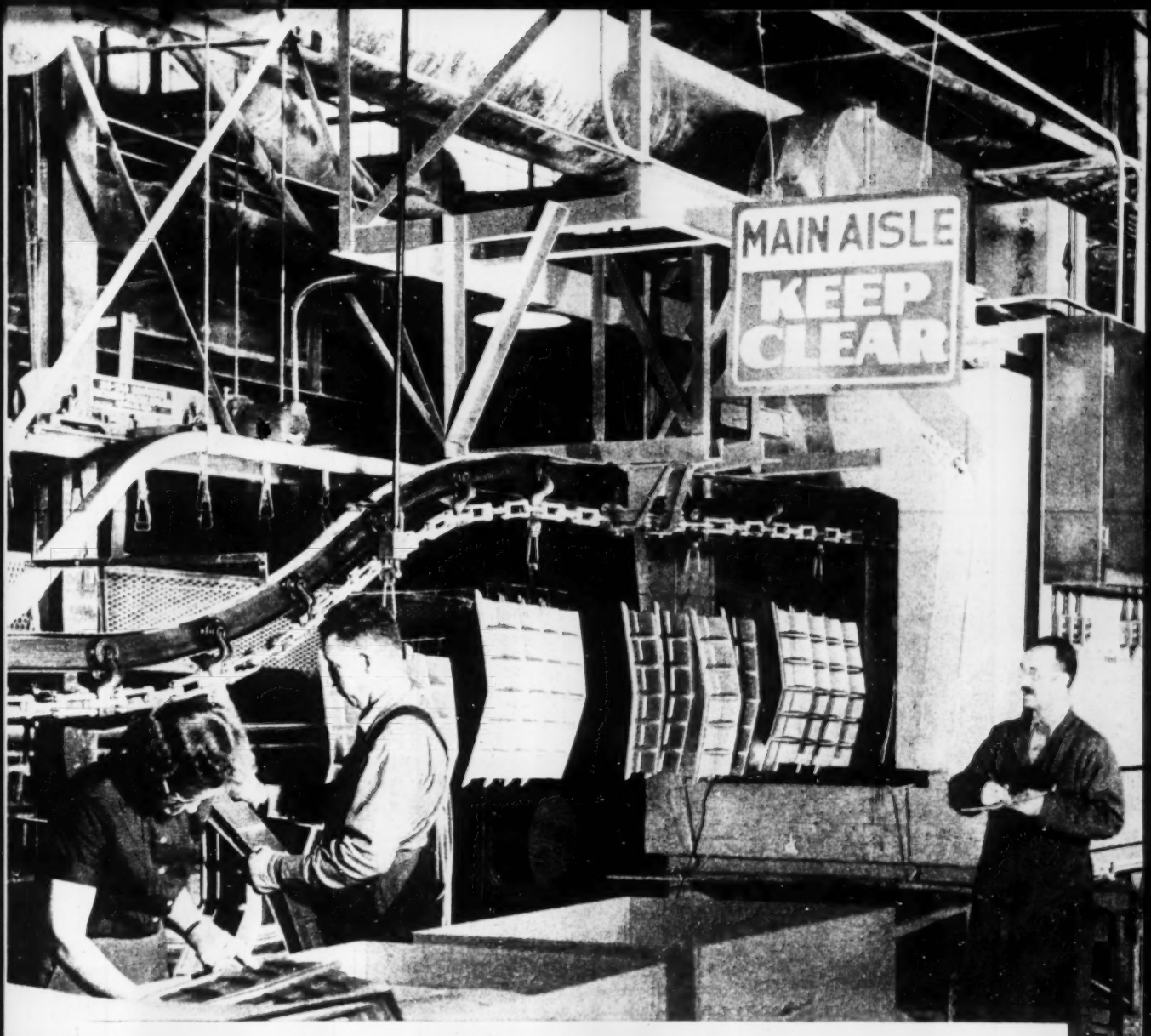
UNCLE SAM IS LOSER: Another thought-provoking feature of U. S. Steel's annual report is its reference to strikes. The corporation's loss in production from strikes since V-J Day in 1945 is an estimated 18.9 million tons. Uninterrupted operations of all increases in capacity since Jan. 1, 1946, would have produced a cumulative total by the end of 1952 of about 19.7 million tons. Thus, the report says, "strikes have nullified nearly all the production benefit otherwise available from these capacity increases."

But this isn't all. In 1951, U. S. Steel provided for $473,300,000 in income and other taxes. In 1952, due to the steel strike, the tax burden was only $185,300,000. Had the strike not occurred, the tax take probably would have been higher than in 1951. Former President Truman's blunder in precipitating the wholly unnecessary strike caused the federal government to lose $300 million from one taxpayer alone.

* * *

UTILITY VERSUS STYLE: This week's "Mirrors of Motordom" is devoted in part to the important role that human nature plays in the ordinary purchase of an automobile. The salesmen in motordom (p. 61) realize that there are certain human impulses which respond to definite sales arguments. Apparently there is something of a clash between the buyer who looks for utility and the one who is attracted by style, fads, gadgets and ornate frills.

Until somebody comes along with a better answer to this problem, we'll stick to Charles E. Wilson's reply to a questioner several years ago. The boss of G. M. was asked whether his engineers designed cars for utility or good looks. His classic reply was that General Motors tries to strike a reasonable balance between mechanical perfection and attractiveness—in short, G. M. would like to give you an "attractive blond who can cook."



Fast, Efficient Production Methods Save You Time and Money on Metal Stampings at Firestone

ALL production is completely integrated. Stampings move without interruption from the large multiple-die presses on through welding, heat-treating, bonderizing, painting and baking, as required. Handling is reduced to a minimum. Precious man-hours are saved. Your job comes through faster and cheaper.

Firestone is one of the nation's prime fabricators of heavy, large-size stampings now in big demand in defense sub-contracts. For a complete cost analysis of stainless steel, carbon steel and aluminum stampings and sub-assemblies, write today to Metal Stampings Division, Firestone Steel Products Company, Akron 1, Ohio.

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Meeting Emergency Demands for Steel

Here are records of six emergencies faced—and met—by Ryerson Steel Service:

Shutdown Averted

4:30 p.m.—1000 lbs. bar stock urgently needed to avert shutdown of night operations. Order processed by office at 4:35; goes to warehouse at 4:41. Steel leaves Ryerson plant at 5:30; arrives at customer's plant (7 miles away) at 6:05 p.m.

Shipped in 1½ hours

10:15 a.m.—two plates needed immediately. With customer still on phone, Service Department alerted. Steel sheared to size and on its way by 11:45 a.m. same morning.

Night Shift Comes Through

3:00 p.m.—order phoned in for 20,000 lbs. of sheet steel. Needed (90 miles away) at 8:00 a.m. next day. Working through the night, Ryerson warehouse crew cuts the steel—loads it on truck that leaves at 6:00 in the morning. Shipment arrives at customer's plant on time.

Breakdown Saturday—Production Monday

Saturday—11:45 a.m. Emergency call. 8" alloy steel round needed to repair breakdown of main shaft. Cut during lunch hour, the 1700-lb. bar is immediately trucked to airport; loaded on cargo plane. Customer meets plane on arrival in distant city. Repairs are completed Sunday; full production resumed on Monday.

Delivery 600 Miles Away—7 Hours

3:00 p.m.—200 lbs. of flat bars, in cut lengths, needed in a hurry 600 miles away. Just 2½ hours after receipt of order, plane takes off with steel from Ryerson. At 10:51 p.m. same day, customer has his steel.

Still Hot When Delivered

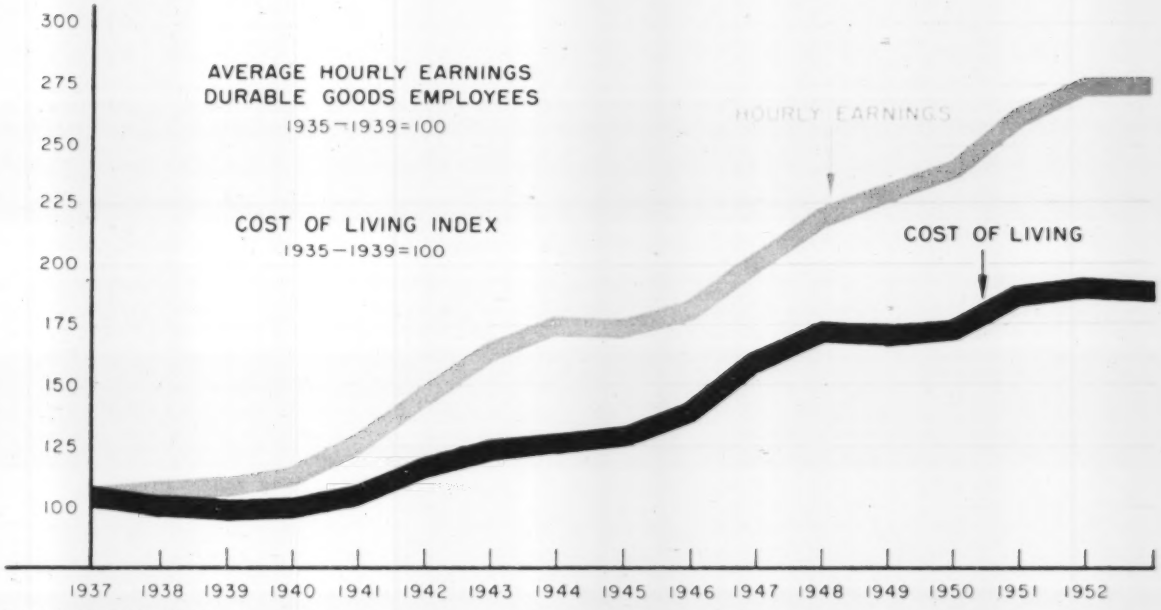
11:15 a.m.—Manufacturer reports breakdown; needs 2" x 72" x 10' plate at once—must be flame cut. Plate delivered at 2:15 p.m., still hot.

Of course, out of thousands of orders, we can fill only relatively few at such breakneck speed. However, in emergencies, the world's largest steel service organization, with 15 interconnected plants, is your best source for steel. And, despite some shortages, you can also count on Ryerson for most every day-to-day steel requirement. So when you need steel—carbon, alloy, stainless—call your nearby Ryerson plant.

PRINCIPAL PRODUCTS: CARBON, ALLOY & STAINLESS STEELS—BARS, STRUCTURALS, PLATES, SHEETS, TUBING, MACHINERY & TOOLS, ETC.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • DETROIT
PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE



Labor Outlook: Fair and Calm

Prospects for peaceful negotiations on unions' demands bright. Modest wage increases likely in auto and steel industries. Major work stoppages unlikely

LABOR news will make fewer headlines in 1953.

Outlook is for a relatively calm year in labor relations. Negotiations will be approached in a thoughtful, ruminative manner by both unions and employers. Missing will be the fireworks and emotionalism of most other postwar years.

Bargaining will be conducted by labor and industry. Government will not be a party.

The unions will win some modest economic gains. They may obtain some enlargement in social security benefits. There will be more talk about the guaranteed annual wage and tying productivity in with wages.

Unions Lose Weapons—The unions will ask for large wage increases, but won't get them. Union leaders don't even expect them. Neither do the union members. They have lost some of their previously powerful weapons.

They have lost the backing of a national administration which owed a political debt to the union chieftains. The Eisenhower administration is demonstrating that it will take a fair, reasonably friendly attitude toward labor. But it isn't going to grant the unbridled license given the unions by the Truman administration.

The cost of living index is holding level or edging downward. That destroys one of labor's big arguments for a substantial wage increase.

With the freeing of wage and price controls and the return of competitive markets, industry will be more reluctant to grant heavy wage increases.

Shakedown Cruise—Both the unions and employers will proceed cautiously in 1953 labor negotiations. Both are cognizant of the new political climate and the new leadership in the big unions. This year will be a period of getting used to new trappings, new mental furnitures, new associations.

This already is showing up in the preliminary negotiations between General Motors and Walter Reuther's United Automobile Workers-CIO.

Two months ago, Mar. 1 was circled in red on union and GM calendars. That was the date when Mr. Reuther said the escalator problem would have to be settled. But Mar. 1 passed unnoticed.

GM offered to put 14 cents of the escalated wage into the base rate. Union chieftains said it wasn't

POSTWAR STEEL WAGE SETTLEMENTS

	CENTS
1946	18.5
1947	16.0
1948	13.0
1949	12-14
(in pensions and insurance)	
1950	16.0
1952	21.1
1953	?

Schoolmarm for Industry

Hollywood Movie Shows How a Business Operates

EMPLOYEES of Westinghouse Electric Corp. are getting a sugar-coated education during working hours. They see a 20-minute Hollywood-made movie and participate in a discussion period afterward, all with a view of learning how America's economic system works.

The latest project, called "Let's Face It," shows through the simple story of a housewife, her husband and her brother-in-law, the plain facts of operating a business. Westinghouse is among the first companies to offer its employees a chance to participate in the program, developed by the United States Steel Corp., in co-operation with the American Economic Foundation.

Is it well received? Westinghouse has been asked repeatedly by employees for this follow-up to a similar program, "In Our Hands," conducted in 1951. The "In Our Hands" material is still being used by service clubs and other organizations. In all, about 300 organizations outside Westinghouse asked for it.

"We think 'Let's Face It' will be greeted with just as much enthusiasm," says T. O. Armstrong, Westinghouse's director of personnel services.

enough. But they didn't say it very loud. The issue is still open for compromise.

Then the UAW pushed for an increase in the annual improvement factor, from 4 cents to 5 cents. GM probably won't give an increase here because 4 cents is a little more than the average annual increase in productivity and the company can't see any reason why it should be increased. The union is expected to drop its demand for the increase to 5 cents.

Woolworth Settlement — Detroit labor observers believe the union will get somewhere between 5 and 10 cents in total economic gains when settlements finally come.

The Steel Case—Over in Pittsburgh, President David J. McDonald and his aides in the United Steelworkers are silent on what that union's demands will be. They are waiting until the wage and policy committee meets about mid-April before announcing 1953 demands. Contract reopenings probably will be asked just before May 1.

Objective observers believe McDonald's first demand will be high, perhaps 20 to 25 cents an hour. That will be only an asking price. The steelworkers won't get it, don't even expect it will be considered seriously.

But Mr. McDonald probably will get a little something for the steelworkers. This again will fall in the 5 to 10 cents an hour range.

Wages Only?—The contracts between the United Steelworkers and the major companies provide for a reopening this year to consider wages only. That provision of the contracts was strengthened substantially a year ago.

But neither the union nor the industry is sure that bargaining can be limited to wages only. The union would like to talk about an increase in pensions. They may propose either lifting the benefits under the present program, or the exclusion of social security benefits from companies' pension plans.

The union also wants to talk about the guaranteed annual wage. Action this year is unlikely, but the union would like to get it on the agenda for 1954. There also will be a lot of talk about productivity. If a sensible plan to link wage increases with increases in productivity is proposed, the companies will be willing to listen.

Something for Dave—The steelworkers' approach to the bargaining table likely will be conciliatory. They don't want a strike this year; the scars of the 1952 walkout haven't healed yet.

The new leadership would like to improve and consolidate its position with management. Formerly good relationships between the steelworkers' union and management have deteriorated over the past several years.

The union is expected to stress its relative stability, the fact that it has done a good job in excluding communists from its leadership. It may suggest that a little raise would help the leadership with its members and with rival union leaders.

Some steel producers may go along if the price is right.

Catching Up — Smaller metalworking companies who evaded the pension and insurance drive several years ago by giving their employees a few cents additional in wages may find they were only borrowing time. Pressure will be put on some of these companies for pensions and insurance programs this year.

Organization — The unions can use a reasonably peaceful year. Both the steelworkers and the auto workers are starting new organization drives. The auto workers are closing in on a lot of small plants, particularly in outlying communities. They are going after more job shops.

The steelworkers are campaigning to organize Great Lakes seamen, miners and metalworking plants.

Both the steelworkers and the auto workers want to be the biggest union in the CIO.

January Payroll Sets Record

A record $285,361,000 was paid workers in the iron and steel industry in January, exceeding the previous high set in October, 1952, by $2,465,000, reports the American Iron & Steel Institute. The average hourly rate for the 683,000 employees was $2.216.

Expanded Capacity for J&L

Jones & Laughlin Steel Corp.'s $415-million expansion program is nearly completed says the company's Annual Report for 1952.

All phases of J&L's operations from production of raw materials to finished steel were affected by the improvement and expansion program.

Price Controls End . . . Business Freed

But don't expect an immediate rise in prices. Only adjustments are in store

PRICE CONTROLS may be about as dead as the dodo bird, but don't look for too much of a flurry in steel prices. Practically nobody is planning anything more than price adjustments that are now a couple of years overdue.

The men who have been advocating a free economy apparently are going to be wise in their use of it now that it is a reality. The end of controls did not catch them napping, because it was common knowledge that they would end soon anyway. But what to do next will take a lot of study and serious thought. American businessmen have been operating under controls for so long that now that they have a moderate amount of freedom, they will have to take some time to get used to it. No longer are they hampered by wage controls, price controls, and even much by materials controls.

Sobering Thoughts — Several things are going to hold the price level pretty much as it now is. First, competition will be more in evidence later this year than for a long time. Second, the fear of what a flurry of price hikes might do to the general economy causes some hesitation. Third, general price increases might cause the unions to agitate for higher wage increases. Fourth, the men who supported President Eisenhower in his bid to end all controls are not prone to put him on the spot by jumping prices.

That does not mean that lifting of controls will go unnoticed. For instance, when steel producers were granted a price hike after the strike, they did not hesitate to say it was insufficient. For some products it was, but for most it was not. It will be natural for them to adjust their prices accordingly, but the general level should be little affected. As of late last week, no definite action was taken by any major steel producer.

Some Will — Some commodities were frozen at such low levels that increases are expected to make their appearances in an attempt to find the normal level. One example is sulphur. Freeport Sulphur Co., New York, has already notified its customers that it is raising the price from $23.50 to $27.50 a ton. Port Sulphur, La. Jefferson Lake Sulphur Co. Inc., New Orleans, expects to follow suit soon.

Some commodities were granted price increases within the last half year which were considered sufficient. For instance, the Continental Foundry & Machine Co., East Chicago, Ind., announced that it probably would stick with the 5 per cent boost granted in January.

Proposes Emergency Freeze Plan

A 90-day simultaneous freeze of prices, wages and rents in the event of a national emergency arising from a foreign source was recommended by the Chamber of Commerce of the United States to replace any new form of stand-by controls.

The chamber reiterated its stand against any form of stand-by controls, claiming that the "threat of action would serve as a barrier to the free play of economic forces." At the same time, it recognized the need for some means of rapid action in case of serious international developments which might threaten the American security.

A form of rationing probably would accompany the freeze to assure an equitable distribution of available supplies. Also, some system would have to be set up to eliminate the inequalities that would result from a sudden clampdown on prices, the chamber pointed out.

Iron Ore Prices Rise

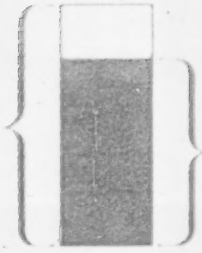
Selling prices on lake iron ore will be higher for the 1953 season. One leading seller, Cleveland-Cliffs Iron Co., Cleveland, last week effected a new price schedule for second quarter which it will continue through the season unless increased wages necessitate a revision. Labor rates in the Lake Superior iron ore industry are subject to review July 1.

Cleveland-Cliffs' new schedule followed upon sales of substantial tonnages to several steelmakers at prices based on $9.70 per gross ton, delivered lower lake ports, for Mesabi Range nonbessemer ore. This new base price, after including advances in transportation and handling costs of 37 cents per ton, hitherto paid by the purchaser, increases cost of ore to the buyer 28 cents per ton.

Price action by other ore sellers is expected. In past years, prior to government control, initial sales of ore for the season set the price pattern for the industry.

EXCESS PROFITS TAX

Of 2639 firms reporting they paid excess profits tax . . .



78.6%

. . . were small companies employing 500 persons or fewer*

*From a survey by National Association of Manufacturers

—puts the brakes on small firms

THE EXCESS PROFITS tax weighs heaviest on young companies struggling to expand, concludes the National Association of Manufacturers after running a survey of 2639 companies that had paid EPT in one or more of the last three years.

Nearly 80 per cent of the reporting companies were in the small business category, employing 500 or fewer persons (see the chart).

Taxpayer's Make-Up—NAM ran the survey to get industry's view of the controversial tax which is due to expire June 30, 1953. They found the largest percentage of surveyed companies paying the excess profits tax was in the 101-500 employee group constituting 43 per cent of those subject to the tax. Companies having only 50 or fewer employees were 16.3 per cent of the EPT-paying respondents in the survey; companies having from 51 to 100 employees made up 19.3 per cent of those paying the tax.

The excess profits tax is based on the average earnings of an incorporated business for the three best years of 1946 through 1949. Five-sixths of this amount is considered "normal" earnings and is taxed at 52 per cent. Everything over the normal earnings is considered "excess profits" and is taxed at 82 per cent, with an over-all limit on total taxes of 70 per cent.

Rising Upper Limit—NAM's survey also revealed a steady increase in the tax load of companies paying excess profits taxes. In 1950 the upper limit of the concentration of "effective tax rates" the combined, normal, surtax and excess profits tax rates was from 50 to 52 per cent. But, in 1952, the 50-52 per cent had become the lower limit, and the ceiling rate of 70 per cent had become the upper limit for the tax load.

Firms which had relatively low earnings for the 1946-1949 period, and that would include new and expanding small business, find the tax siphons off much of their reinvestment capital as they progress to the larger sales volumes. For other comments from the NAM survey, see the box below.

BUSINESSMEN SPEAK UP ON THE EXCESS PROFITS TAX

"Due to excess profits tax we find it almost impossible to plan for any expansion of plant and, therefore, we cannot increase our employment."

"Being a small firm, just beginning to rapidly increase sales, the holding of our profits to 85 per cent of net profit for years, 1947, 1948 and 1949, takes away all incentive for expansion or increased effort."

"They (taxes) have not only unfairly reduced the return to the stockholders on their investment but have also limited the benefits, monetary and otherwise, for employees."

"The excess profits tax has caused us to forego expansion plans which would have enabled us to accelerate delivery dates on urgently needed equipment for the armed forces."

Maintenance Costs High

Keeping machines in working order is a costly but necessary task of American industry

MACHINERY MAINTENANCE costs are $15 billion annually, illustrating the importance of continued good care of production facilities. The estimate was made by H. R. Meyer, manager of maintenance sales for Westinghouse Electric Corp., Pittsburgh, at the second Electrical Maintenance Conference, in Los Angeles.

Mr. Meyer told conference members that engineers can conceive an idea, lay it out on paper, see that it is properly built in the factory and often make sure that it is correctly installed. All their work would be wasted if it were not for men who see that production tools are properly maintained.

Dwindling Resources—Recently, the speaker remarked, "We have been acting like rich potentates with unlimited wealth and an inexhaustible supply of all the materials from which the goods we use are made." Mr. Meyer's conclusion was that manufacturers should devote more time to husbanding their resources.

Alan Wood To Add Facilities

The Alan Wood Steel Co. will spend $2,750,000 for installing a new pickling line and other equipment for cutting to length, side shearing and further improving the company's finished strip product.

"While these finishing lines will provide us with new markets for our hot-rolled products," says John T. Whiting, Alan Wood's president, "they are also important in achieving our ultimate goal of entering the cold-rolled field. They represent the final preliminaries for the installation of a cold mill." Installation of the pickling line should be completed in 1953, perhaps by October.

Pittsburgh Steel Diversifies

Pittsburgh Steel Co.'s modernization and expansion program, begun in 1950, is nearly complete. By the end of 1953, the company will have a diversified line of products, consisting of hot and cold-rolled sheets and strip, seamless tubular products, wire products and

specialty items of coated strip, made by the Thomas Strip Division.

"In effect," says a company spokesman, "Pittsburgh Steel will be a new steel company, producing all of its steel in larger, lower cost open-hearth furnaces and more than 80 per cent of its finished steel products on new mills of latest design."

That, plus a record high quarterly sales and shipment record of $40 million on 308,000 net tons in fourth quarter, 1952, makes the outlook for 1953 promising.

CF&I Mill Nears Completion

The structural steel framework of the Colorado Fuel & Iron Corp.'s new seamless tube mill at Pueblo, Colo., is completed. The mill, scheduled to start production early this fall, will produce from 150,000 to 175,000 net tons of seamless tube annually.

"It represents an important forward step in CF&I's program of product diversification," says A. F. Franz, president of the corporation. "The seamless steel pipe produced here will help meet the needs of the American petroleum industry by providing western-made pipe for use in drilling oil and gas wells."

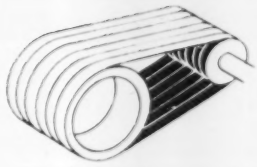
Equipment for the mill includes two piercing mills, weighing 304 tons each with 3000 hp motors, a 275-ton rolling mill, powered by a 1500 hp motor and other mills.

Markets Stressteel Bars

Stressteel concrete reinforcing bars will soon be marketed by Republic Steel Corp.'s Truscon Steel Division, Youngstown. Truscon will also join in promotion of prestressed concrete a mechanical method of imparting great strength to cast concrete sections by applying tension to bars or wires imbedded in the sections.

Stressteel tensioning bars make prestressed concrete construction competitive with reinforced concrete and structural steel as a basic medium of construction, Truscon says. In Stressteel construction, tensioning bars extend through the entire length of the cast concrete section.

Truscon will sell and promote the bars as an agent of Stressteel Corp., Wilkes-Barre, Pa.



Industrial Belts:

Keep Industry's Wheels Turning at a Good Clip

AS FAR as the industrial beltmakers are concerned, manufacturers need not worry that their assembly lines will slow down or the wheels of industry will stop in 1953. Sales of conveyor and transmission belting are going to continue on the high plane which they've been traveling since late 1950, say most producers of that equipment.

Dollar sales this year should equal those of 1952—possibly may go higher. Last year as a whole was fairly successful, although it was slightly under the heavy sales of '51 for several reasons.

Stimulus—First of all, the Korean conflict brought about the increased defense efforts which were felt heavily in 1951. Secondly, it also brought on "scare" buying, the result of which was a heavy inventory of most belting goods going into 1952. Finally, the steel strike last summer put a crimp in belting sales and spoiled what could have been a record year.

If sales this year go as expected, the bulk of the increase could be in conveyor belting as new applications are uncovered. V-belting will hold its own—or better. The popularity of this type belt has been at the expense of flat transmission belts which are in their waning days. The V-belt has proved its value and now constitutes about 80 per cent of the belting in the power transmission field.

Select Few—In numbers, the industry is small. Only about 19 companies make flat transmission and conveyor rubber belting, and only 10 make V-belts. There are about 170 makers of leather belting, but a half dozen account for most of the production. In addition, there are canvas and cotton beltmakers, but they represent only a small portion of the over-all industry.

Two major uses account for the bulk of belting: Conveyors and power transmission drives. The big potential market lies in the former. As materials handling becomes more complex, more conveyors will be used, not only in industrial plants, but also in mining operations and power projects. Also, higher wages add importance to the savings in labor afforded by conveyor belt systems.

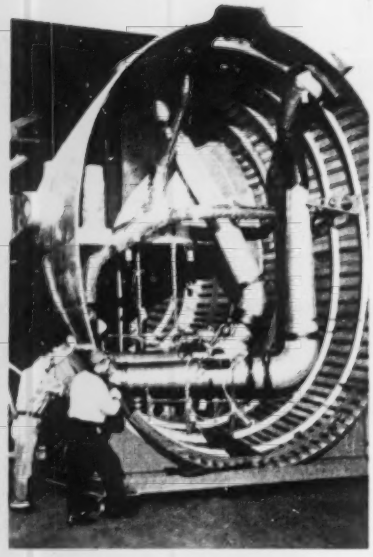
Transition—V-belts are probably past the peak of their invasion in the power transmission field. Most manufacturers feel that the 20 per cent left to the flat belts will remain fairly constant. But the more efficient Vs will gain in importance through new applications—everything from fractional horsepower motors to the largest industrial transmissions.

Regardless of new applications, the belting industry should remain fairly active on its replacements alone. One manufacturer of rubber belting estimates that 80 per cent of his output goes to that market. A spokesman for the leather belting industry estimates it at 90 per cent. Most admit that "at least a substantial majority" goes for replacement.

What Is Standard?—Most belting is standard, lending itself readily to a replacement market. There is constant research and development of course, but once a new project has been engineered, the parts for it quickly become standard stock.

That partially accounts for the improved delivery date situation. In most cases, beltmakers report orders can be met from standard stock on demand. One man said, "If you don't want belting tomorrow, don't order it tomorrow." Another is sure there is some idle equipment in the flat belt industry which can turn out orders as they are received.

In any case, it seems that the peak in belting is not over. It may be just arriving.



To Keep a Giant Warm

Enough heat to warm a dozen six-room houses is produced in this aircraft tail stub assembly, produced by Chrysler Corp.'s plant at Los Angeles. The tail assembly will go to Douglas Aircraft's Long Beach, Calif., plant for final assembly into a Douglas Globemaster C-124 transport

New Materials for Grinding

Development of substitutes for diamond bort in grinding tungsten carbide cutting tools was hailed as encouraging in a conference of manufacturers and government engineers. Presiding was Herbert Newman, of NPA's Metalworking Equipment Division. It was generally agreed by members that new processes will conserve bort; various economical and mechanical advantages were cited.

Prof. O. W. Boston, Engineering Research Institute, University of Michigan, who has tested the various methods, summarized his findings: "Carbide tools sharpened by the electrolytic method, the ultrasonic method or the abrasive-belt method all give satisfactory results and their performance is comparable to diamond-ground tools if similar tool angles are used."

Crane Draws Titanium Plans

Crane Co. may build a $15 million to $20 million titanium plant near Nashville, Tenn. The Chicago company is seeking an option on a 250-acre plant site.

New Plating Process Saves Nickel

Chemical plating process takes half to two-thirds less scarce metal. Provides uniform thickness of nonporous plate, regardless of size or shape of part

NICKEL SAVED is nickel earned. Users of the critical metal may soon realize savings through a chemical plating process which provides uniform coverage of irregular or complicated shapes.

General American Transportation Corp., Chicago, believes it can save one-half to two-thirds of the nickel required for electroplating. William J. Stebler, executive vice president, says the process "may well prove to be one of the most far-reaching industrial developments since World War II." It uses no electrolytic equipment but depends on constant circulation of clean solution through acid-resistant vessels at temperatures up to 212 degrees.

Kanigen — Dubbed "Kanigen," the plate is a nickel-nickel phosphide composition which the company says will permit plating of almost any solid substance with a dependable, predictable thickness of nonporous plate. Minimum thickness will be within 10 per cent of average thickness. It can be controlled to within 0.0001-inch and is not likely to show pores at plating thicknesses of 0.0005-inch.

General American is building plants at East Chicago, Ind., and Los Angeles to exploit the process. Upon their completion, by the third quarter, other companies will be licensed to use it. The company believes any article regardless of size and shape can be uniformly plated. General American has carried out production-line plating of steel, copper, brass, bronze, stainless steel and aluminum. Tests indicate plating of magnesium, plastic and glass is practical for most purposes.

Possibilities — Intricate parts such as gears, valves, bearings and pieces with screw threads or other indentations that must be uniformly coated can be uniformly covered. Overmachined parts can be built up to tolerances.

Claimed to have excellent adhesion, coating has low ductility and is not recommended for parts subject to considerable flexing. Plated steel specimens pulled to breaking point in tensile machines show no flaking or chipping of plating. Tests conducted for two hours in clean aerated hot water show virtually no pores.

For Tank Cars—General American, considering the Kanigen process neither an alternate nor substitute method of nickel plating, originally set out to develop a process for interior coating of tank cars carrying corrosive chemicals and materials that can't be contaminated by "pick-up iron." Research centered around reduction of nickel by hypophosphites, and followed the lines established by earlier Bureau of Standards work.

Break-Even Point—Comparative cost of Kanigen plating varies from break-even to decided savings, engineers say. For thin coatings it is more economical than electroplate, but this advantage decreases with thickness. Special equipment, thermally insulated, must be provided for the process. Batch dipping of small parts is considered feasible. Most plating-room procedures are followed.

Estimates of nickel saving are based on these factors, says General American: Kanigen's nonporosity; uniform plating that requires no selective overplating, and the fact that two to three times more nickel is needed to provide the same corrosion resistance with electroplating process.

Single Catalog Nears Reality

A new single supply catalog for the armed forces will be "practically completed" by the end of 1954, Rear Admiral J. W. Fowler, director, Defense Supply Management Agency, told a House Armed Services subcommittee. The single catalog, which will replace 15 or more now in use, will permit procurement savings by the armed services of up to $4 billion a year, he declared.

Rheem Gets $5 Million Order

Rheem Mfg. Co., New York, says it has obtained a $5 million supplemental contract to produce mortar shells at its San Pablo, Calif., plant. The supplemental contract is for 155 mm shells and increased production of 81 mm shells. The company recently delivered its two-millionth 81 mm mortar shell to the San Francisco ordnance district. Rheem also was awarded an additional facilities contract valued in excess of $1,250,000 for expansion of the San Pablo plant. Employment will be boosted between 350 and 400 persons at the plant.

ODM Issues 169 Write-Offs

Office of Defense Mobilization during the two weeks ended Mar. 11 stamped "O. K." on certificates of necessity for rapid amortization on 169 new or expanded facilities valued at $227.6 million. Largest certificate went to the Wheland Co., Chattanooga, Tenn., for primary aluminum facilities valued at $35,450,000, of which 85 per cent may be written off. Other metalworking companies receiving certificates valued over $1 million: Youngstown Sheet & Tube Co., metallurgical coke facilities; Atlanta Mining & Smelting Co., sponge iron; Yale & Towne Mfg. Co., materials handling equipment; General Electric Co., aircraft parts.

Renegotiation List Shrinks

Refractories minerals, through additions to the list in Part 1453 (Mandatory Exemptions from Renegotiation) of the Renegotiation Board's regulations, now are exempted from renegotiation as a class. Added to the exempted list are bauxite; chromite; clays including kaolin, hard or flint clay, semi-hard or semi-flint clay, refractory siliceous clay, refractory plastic clay; diaspore and diasporitic clay; kyanite; olivine; silica ganister and zirconium.

Also exempted are blast furnace slag, low refractory clays and brick and tile made from low refractory clays including ladle brick, common brick and building brick.

Aluminum Spike Opens a New Railroad

The driving of an aluminum spike by D. A. Rhodes, vice president and general manager of Kaiser Aluminum & Chemical Corp., marks completion of Kaiser's new 13-mile railroad in Jamaica, British West Indies. Kaiser has acquired a 50-year reserve of Jamaican aluminum ore to supply its plants in this country

ACF-Brill To Make Camera Pods

ACF-Brill Motors Co., Philadelphia, will start work on a $4.9 million Air Force contract for camera pods to be used in Boeing B-47 jet bombers. More than 112,000 square feet of floor space in the company's Philadelphia plant are already devoted to production of aircraft components, says C. W. Perelle, president. Recently installed equipment includes salt bath heat treatment tanks, a refrigeration room and an aging oven.

CHECKLIST ON CONTROLS

Price Regulations

DECONTROL — General Overriding Regulation 44, issued and effective Mar. 12, 1953, removes from price controls all commodities remaining under control except sulphur, sulphur chemicals and a selected list of metals, machine tools and steel mill products.

END OF CONTROLS—Amendment 1 of General Overriding Regulation 44, issued and effective Mar. 17, 1953, removes from price controls all remaining commodities heretofore under control. Manufacturers must keep records as specified in the orders under which they operated, but no longer than two years or no later than Apr. 30, 1955, whichever comes first.

Appointments in Washington

Frederick B. Lee was appointed administrator of the Civil Aeronautics Administration.

The President named as consultants to the National Security Council: Charles A. Thomas, president, Monsanto Chemical Co., St. Louis; James B. Black, president, Pacific Gas & Electric Co., San Francisco; Eugene Holman, president, Standard Oil Co. of New Jersey; John Cowles, president, *Minneapolis Star and Minneapolis Tribune*; Dillon Anderson, attorney, Houston; David B. Robertson, president, Brotherhood of Locomotive Firemen & Enginemen, Cleveland; and Deane W. Malott, president, Cornell University, Ithaca, N. Y.

Maj. Gen. Dewitt Peck, USMC (ret.), was named deputy director of manpower utilization, Office of Assistant Secretary of Defense.

SELECTED DEFENSE CONTRACTS IN EXCESS OF $100,000

PRODUCT	CONTRACTOR
Shells, 155 mm	C. A. Dunham Co., Chicago
Shells, 105 mm	General American Transportation Co., Wiggins Vapor Seal Div., Chicago
Shells, Mortar, 60 mm	Kwikset Locks Inc., Anaheim, Calif.
Shells, Mortar, 81 mm	Conlon-Moore Corp., Cicero, Ill.
Fuzes	Price Pfister Brass Mfg. Co., Los Angeles
	AP Controls Corp., Milwaukee
Combat Vehicle Parts	Motor Wheel Corp., Lansing, Mich.
Aircraft Engine Parts	United Aircraft Corp., E. Hartford, Conn.
Maintenance Parts	Douglas Aircraft Co. Inc., Santa Monica, Calif.
Switch Assemblies	Revere Corp. of America, Wallingford, Conn.
Refrigeration Units	Airesearch Mfg. Co., Los Angeles

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

Best use of businessmen today is a fundamental objective in reorganization of the Commerce department. More industrialists will serve in advisory committees

MORE EFFICIENT use of businessmen and industrialists, both in formulating and administering government policies regarding industry, is a keystone in the Commerce department's reorganization plans.

Profiting by experience gained under the National Production Authority, Commerce is to have more commodity and industry groups than in the past. These will be headed by industry men assisted by Commerce-trained career men in administrative duties.

Borrowing Experts — Industry men will be borrowed from their employers, usually without compensation. They will serve on a rotational basis, as has been the practice in the NPA, and they will maintain contact with their industries through industry advisory committees.

Task groups of industry and business representatives will be organized to advise on matters affecting business, such as depreciation and other tax angles, the right to absorb freight charges to meet competitors' delivered prices and the development of foreign trade.

First Problem — Probably the first task group will be consulted on possible solutions to difficulties hampering growth of small business due to present tax laws and regulations. As Commerce representatives see the picture, the small company that does an outstanding job on manufacturing and selling is often against insuperable obstacles in trying to finance necessary expansion.

On one point there is insistence: Industry men called to serve the Commerce department must be men of wide experience and outstanding ability to attract the respect and backing of the industries from which they will come.

Streamlining — The reorganization plan, whose final details will not be blueprinted for several months, is aimed not only at streamlining the department's work and reducing its expense by eliminating unnecessary services, but at creating a more favorable climate for business expansion in the United States.

NEA

SEN. WILLIAM A. PURTELL

. . . "excess profits" is a misnomer

Tackles Tax Terminology . . .

Sen. William A. Purtell (Rep., Conn.) proposes that if the need for a balanced federal budget precludes tax reduction, we should at least get rid of the term "excess profits tax." Call it a "defense tax," he continues, "and label it definitely as temporary."

The name "excess profits tax," he told STEEL, has a bad connotation. Generally there is no such thing as excessive profits in industry, and certainly there are none on government business under redetermination and renegotiation procedures. Furthermore, the tax penalizes efficient operators, stifling expansion which, with the increasing birthrate, is necessary for prosperity.

On entering the Senate, Senator Purtell gave up the presidency of Holo-Krome Screw Corp., Hartford, Conn., and directorships in Hartford companies including Colt's Mfg. Co., Veeder-Root Inc., Hartford Gas Co. and Hartford Connecticut Trust Co. He served as president of the American Supply & Machinery Manufacturers Association.

He firmly opposes further government deficit financing. "When you resort to deficit financing, you increase the national debt, and it is now costing about $6 billion annually to carry the debt."

The senator has three committee assignments, unusual for a freshman senator. He is chairman of the Health subcommittee Senate Labor and Public Welfare Committee, and is a member of the Post Office and Civil Service, and Rules and Admission Committees.

An Economist's Philosophy . . .

Dr. Arthur F. Burns, confirmed as economic adviser to the President (the old Council of Economic Advisers was killed by House-Senate action), comes from Columbia University with these basic concepts:

1 There are times when the government cannot stand by and let the course of economic activity run its own way.

2 The American people believe in a free economic society and therefore controls should be indirect, though direct controls in time of emergency might be necessary.

3 At times a certain increase in government spending might be a desirable way to increase employment.

4 There frequently is too much talk of stability of the economy rather than growth of the economy.

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Last year's Congress gave Bureau of Mines authority to shut down dangerous mines. Now Congress has appropriated sufficient funds to enable the bureau to employ 50 inspectors and 25 engineers to enforce that assignment.

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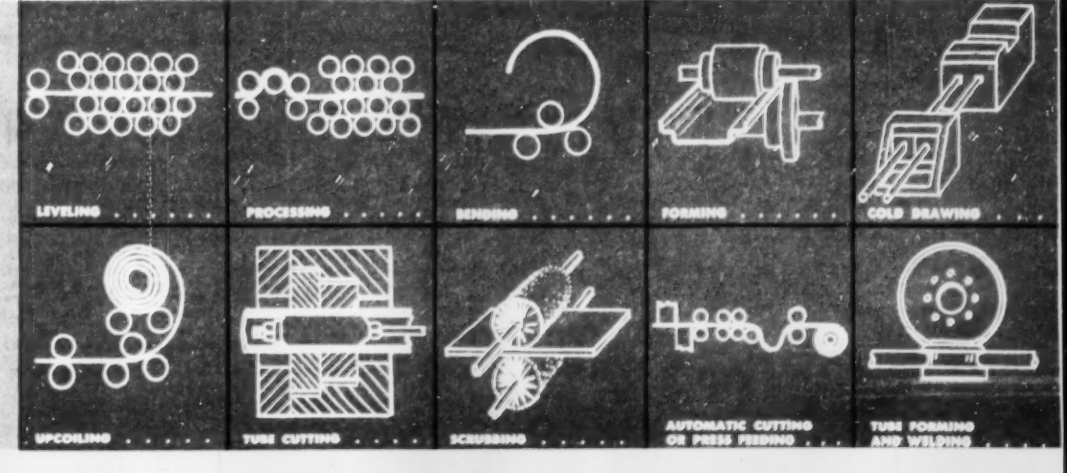

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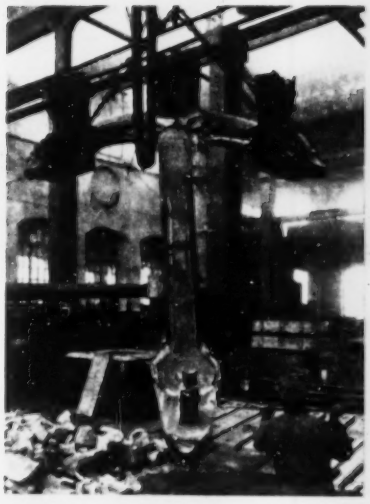
Italian Steel Industry Meets Stiffer Price Competition

All European steel producers are putting emphasis on lower prices. The question is: Will modernization and the Schuman plan be enough to keep Italian steel in the race?



HEAVYWEIGHT: A 7700-pound steel admiralty anchor from the Vanzetti foundry in Milan, Italy

ITALY'S metalworking industry absorbed about 4 million tons of steel in 1952, a high point in Italian history. At the same time, iron and steel imports dropped over the first nine months of the year from 129,598 tons to 91,774 tons and from 110,789 tons to 102,178 tons respectively.

The fateful question for Italy remains in 1953, however: Can Italian steel prices be made competitive with other European producers?

Changing Times — The answer may well be resolved this year. Other European steel producers have expanded and modernized their plant and equipment since the war. Defense needs have leveled off with the result supply-demand balances are near. Expanded capacity coupled with a steel surplus looming in the future have made all European producers price conscious; some price trimming has already been made and more is likely.

Against that background, the Italian steel industry enters the competition with a double-edged sword: Modernization of Italian plant and equipment and special concessions under the Schuman plan.

More This Year — Keystone of the Italian Finsider (Siderurgical Financial Co.) modernization plan is the entirely new steel mill at Cornigliano which will produce 500,000 tons of steel a year and will specialize in hot and cold-rolled flat products. Oscar Sinigaglia of Finsider predicts the whole plant will be in operation by June, 1953. Some coke ovens are already producing; the first blast furnace has been completed and the equipment for the rolling mills is arriving from the United States.

At other Finsider mills, there are one 880-ton mixer and four 33-ton converters producing Thomas (bessemer) steel at Bagnoli. A grinding plant which will crush the Thomas slag for use as fertilizer has been completed. Ilva technicians are completing the mill at Piombino which will have three 165-ton furnaces. The rolling at Piombino has been improved and mechanized. Work is continuing on new billet and rod mills at Bagnoli and on a blooming mill at Piombino.

Big Bite — Finsider produces nearly 50 per cent of the total Italian steel output.

The Schuman plan will certainly help with the fundamental problem of the Italian steel industry high cost of raw materials which must be imported. Italy must buy 33 per cent of scrap iron needs abroad; 40 per cent of iron ore requirements, plus large quantities of coal.

Conceding a Point—A common market price for iron and coal, lower freight rates, lessened duties and allocation of scrap iron at the common market price will go a long way toward lowering Italian steelmaking costs. Beyond that, Italy has special protective clauses in the Schuman plan treaty whereby the Italian import duties on iron and steel will not be reduced at once. The duties will decrease 10 per cent for the first year, 22 per cent for the second, 25 per cent for the third, 45 per cent for the fourth and 70 per cent for the fifth year. Such protection will allow the Italian steel industry to continue expansion and modernization plans for a while before facing open international competition.

The question still remains whether the Italian steel industry can continue its growth of the past several years which has enabled the per capita consumption of steel in Italy to rise from 1235 pounds in 1938 to 1676 pounds in 1951 and 1874 pounds in 1952.

STEEL PRODUCTION IN ITALY*

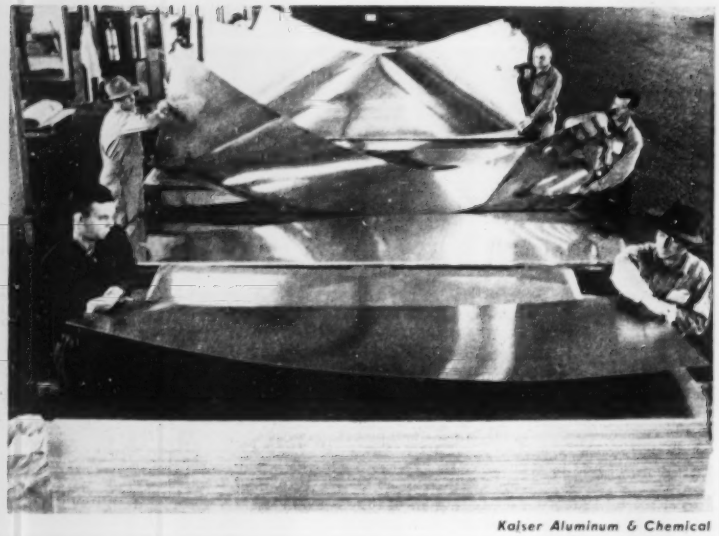
(Millions of Net Tons)

	1950	1951	1952	INCREASE OVER 1951
Steel for Ingots & Castings	1.914	2.440	2.888	11.8%
Hot-rolled Steel Products	1.525	1.931	2.159	18.4%

*Figures for first nine months of each year only.

More Aluminum for Italy

Production of raw aluminum in Italy rose from 41,580 net tons for the first nine months of 1951 to 43,450 net tons over the same period in 1952. Production of intermediary products of pure aluminum and its alloys jumped from 30,250 net tons for the first three quarters of 1951 to 37,290 net tons in the like quarters of 1952. Imports of raw aluminum and intermediary products increased from 3300 net tons to 3850 net tons in that period.



Kaiser Aluminum & Chemical

MORE COMPANIES GET INTO THE ACT

	Number During WORLD WAR II	Number TODAY*
PRODUCERS OF WROUGHT ALUMINUM PRODUCTS		
Sheet	9	18
Foil	5	11
Wire & Cable	13	59
Extrusions	9	49
DISTRIBUTORS OF WROUGHT ALUMINUM PRODUCTS	15	193

*Estimated by STEEL

More Aluminum . . .

Fabricators and distributors can expect the squeeze to ease by the end of 1953. New facilities will boost output to 1.65 million tons in 1954

ALUMINUM FABRICATORS and distributors, eager to expand their applications and tonnages of the light metal, should be sitting pretty by the end of 1953. The *piece de resistance* of the metalworking world a decade ago, its wide acceptance and seemingly endless uses have made aluminum about as common today as the blueplate special. The transformation, accelerated by a world war and the present defense effort, shows little sign of abating as aluminum, the source of which is practically unlimited, forges into second place tonnagewise among the metals.

Dependents — Twenty thousand companies and over a million people today make their living directly or indirectly from fabricating aluminum. Four new primary producers have entered the field since Korea, bringing the total to seven. Wrought product fabricators are two to five times more numerous than during World War II; distributors have multiplied from 15 to nearly 200.

Capacity of the industry at the end of this month will be 1,244,000 tons yearly. By June, 1954, when all presently-contemplated additions are operating, it will be 1.65 million tons—ten times the 1939 level. Planned expansion since Korea alone totals 920,000 tons.

Size and Stature—Added to this total is an expected 600,000-ton capacity in Canada. That brings North American capacity in 1955 to the 2.25-million-ton mark. About 10 per cent more can be expected from recirculated scrap. Secondary aluminum will assume more importance as primary use swells and will eventually account for 20 per cent of total production.

Processing this aluminum into products for fabricators will be about 1.3 million tons of sheet, plate and foil capacity, 774,000 tons of heat treating capacity, according to a 1955 goal set by NPA. The $400 million heavy press program, calling for 17 die forging and extrusion presses, will take large chunks of output.

War Baby—Unlike many metals, aluminum's spectacular growth can't be attributed to development of new refining processes, as they're essentially unchanged from 10 years ago. Military stimulus has condensed decades of normal growth into two uneven spurts. Capacity expanded fourfold during World War II and will more than double under the present defense program. While the entire post-Korea expansion will be privately financed, the government estimates about 85 per cent of all capacity in 1954 will be government-built or encouraged through tax benefits, market guarantees and loans.

The industry that was so shaky in 1949 that two companies wanted to pay government debts in metal instead of money is today briskly confident of its future. Here are eight reasons why aluminum men think their boom will continue:

Enforced Familiarity. Because of war demands designers, engineers and workmen were indoctrinated in aluminum uses and techniques, building a large pool of production know-how.

Adequate supply. Current expansion reassures users about the metal's availability. Except for a few months in 1947 and 1949 aluminum

has never been available for the asking.

Peacetime Markets Alive. There has been no complete cut-off of civilian use because of Korea. Today more aluminum is going into civilian products than before Korea.

Price Stability. As one industry man puts it, "The greatest thing that has happened to aluminum has been the price of copper." The light metal's price today is only 2.5 per cent over the 1939 level, while copper has nearly tripled and steel, zinc and lead have about doubled in the same period.

Technological Advances. New alloys, joining methods, finishing processes will help realize the metal's potential. Trail-blazing by the military—research and development of a magnitude industry just can't afford—has uncovered new uses.

Nibbling at the Markets. Aluminum doesn't steal the lion's share of any market from one metal. Relatively small losses in markets for metals, plastic, wood or masonry means a tremendous gain for aluminum. In storm doors, windows and sash, aluminum extrusions account for about 15 per cent of the market, competing with both steel and wood.

Seasoned Producers and Users. With growth of primary capacity, fabricating and distributing facilities have mushroomed.

The Government Hedge. There's no prospect of defense business hitting zero in the foreseeable future. About 30 per cent of current output goes to the military. In addition, the moratorium on stockpiling that has been in effect the last 18 months will be lifted in the second quarter. Tonnage wanted is a secret, but could encompass a full year's production by the entire industry.

Building, transportation and electrical applications are the metal's most important markets. Other promising fields are appliances and utensils, packaging, farm and oil field equipment, machinery, and processing and materials handling equipment.

Research Payoff—Great technological progress in aluminum is being shown, of an evolutionary rather than revolutionary nature. Strong alloys are being developed with good temperature resistance. Aircraft alloy 14 ST 6 for example can withstand 600° F for 4000 hours. Direction of much metallurgical research is toward high strength non-heat-treatable alloys.

Greatest advance in architectural use has stemmed from use of anodic coatings, where a thick layer of hard oxide protects the metal. A number of buildings now planned will have aluminum facades.

Auto Advances—This year saw changeover by all auto companies to aluminum pistons. The volume auto industry is a prime target for aluminum development men. Optimists see use of 90 pounds of aluminum in each car, as against less than 12 today.

Sandwich-type cylinder blocks and heads seem pretty close to production reality. Aluminum radiators are undergoing intensive research for economical joining methods and for chlorine inhibitors in radiator water.

Wire, Cable—In electrical applications aluminum, with 60 to 64 per cent of copper's conductivity but one-third its weight, goes roughly 60 per cent further than copper. It's used for power transmission, primary and secondary distribution lines and in building wire down to No. 6 size. Sights of the industry are on the huge secondary distribution market. ACSR is firmly established; 80 per cent of today's installations of bare overhead transmission wire over 120 kv are aluminum. In bus bars, a Y-shaped extruded aluminum bus is taking hold.

A problem in connecting aluminum and copper wire is galvanic action. Two new developments are a tin-plated copper sleeve over copper wire in an aluminum connector, and use of a bimetal sleeve, dieclinched joint and neoprene jacket to seal the joint from corrosive atmospheres.

Performance Counts—Tackling its numerous problems with vigor, the aluminum industry has found a lot of the right answers. By facing its problems head-on and with a mature attitude, this young industry is winning respect, recognition and responsibility. It's turning from pie-in-the-sky possibilities to present realities and potential, cashing in on its opportunities for today as well as tomorrow.

SCOREBOARD OF PRIMARY ALUMINUM CAPACITY

(All Figures in Net Tons)

	Capacity June, 1950	EXPANSION 1st Round	2nd Round	3rd Round	TOTAL	Capacity June, 1954
ALCOA	369,750	199,000*	85,000		205,000	653,750
REYNOLDS	223,100	101,500	80,000		181,500	404,600
KAISER	137,375	137,625†	128,200		265,825	403,200
ANACONDA			54,000		54,000	54,000
OLIN				110,000	110,000	110,000
HARVEY				54,000	54,000	54,000
WHELAND				50,000	50,000	50,000
TOTAL	730,225	359,125	347,200	214,000	920,325	1,650,550

*Includes 79,000 tons added capacity achieved quickly at high cost, and which will be used only temporarily. Not shown in totals.
†Includes 37,625 tons added through expansion of existing capacity.

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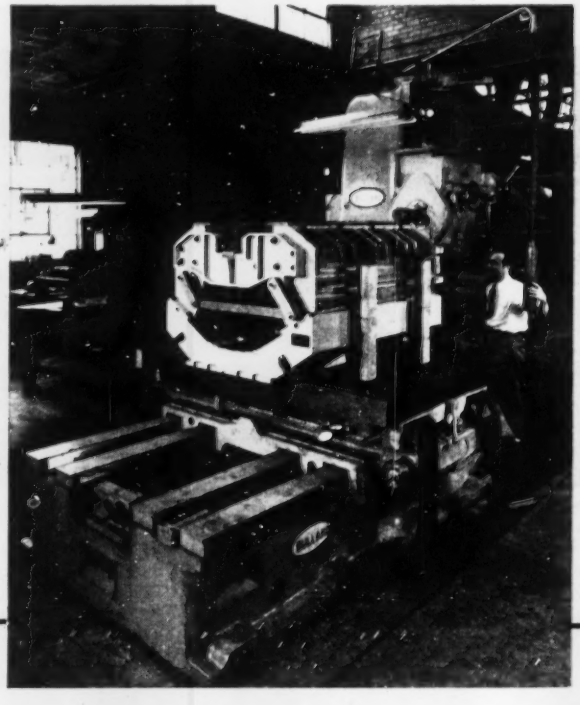

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BRIDGEPORT 2, CONNECTICUT

By FLOYD G. LAWRENCE *Detroit Editor*

Mirrors of Motordom

Don't look now, but the automakers think you're somewhat of a goose in the salesroom. They're glad, though. Selling the intangibles gives them more to talk about

DETROIT

AUTOMAKERS ARE convinced the man in the street doesn't have the brains of a hubcap when it comes to automobiles. But as record auto production rolls like multi-colored lava over the Detroit landscape, they're mighty glad.

Latest example of the auto-intoxication was the automobile show in Chicago. Though many social exhibits were in evidence, basically crowds swelling toward half a million plunked down something over a buck to look at cars their dealers would gladly have shown them for nothing. Automakers just winked at each other and smiled as the crowds filed past. Human nature is staying in line for 1953.

Reassurance is what the automakers need most. In bygone days, selling an automobile was largely a mechanical proposition. The consumer wanted a product that would get him from hill to vale and back again with a minimum of repair and some comfort en route. In answer to this understandable request, the auto company would point out various mechanical features which a man could understand tended to make this result possible. A few lemons like "one cylinder gives half the trouble of two" crept in, but by and large people and the automakers understood what was going on.

Reliability Assumed—Today the picture has changed. In the modern auto, reliability is assumed, just as you can assume that any brand of cigaret you buy will burn. And what does the buyer of today look for? A fabulous pot of gold awaits the Freud of autoconsumer psychology who can figure that one out. Like the cigaret makers, the auto firms are dealing pretty heavily in intangibles. Styling, comfort and taste are mighty tough things to assess and they're the things that play the heaviest role in selling the modern car. The auto companies have tried small cars, dechromed cars, economical cars, stripped cars and all the rest. Inexorably the hand of faltering demand pushes the arrogant manufacturer back into line, but the consumers continue to scream for "something different."

Research in consumer taste is a continuing thing with the auto firms and the same answers keep popping up: New car buyers stick with the same brand in about 70-80 per cent of all cases; women have a persistent voice in new car selection and the average car buyer knows very little about why he likes a make of car himself.

Repeats—A few obvious things can be done working on this information. The chief reason most new car buyers choose the same make every year is because the sales manager is close at hand when the car is in for service, has a perfect opportunity to lure the owner away from his faltering flivver. "Unfortunate that your model had a cheese crankshaft," he consoles. "Now this new job has the trouble corrected and I know your car has been well cared for so I can allow you . . ." Doakes is hooked.

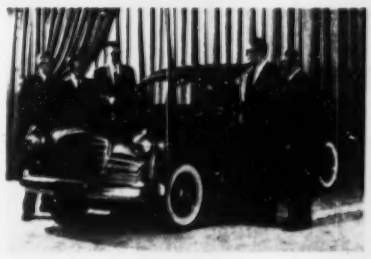
When it comes to the little woman, the automakers are in their glory. Colors go to such shades as fuchsia, chartreuse and one of the very latest "black-black." Interiors are about as virile as a boudoir and as durable as a negligee. Seatcovers are a must when the car leaves the showroom. Chrome that can be inexpensively changed to give a car that "last-year's" look and stretch jig and body-die depreciation is widely employed. Cars take on the flavor of a stainless steel kitchen, look exceedingly new. And then there's the whole line of power gadgets . . .

Sale Is the Thing—Auto design purists wear out their pens complaining and auto engineers and

Packard's Custom Limousine

Nash-Healey Lemans Sports Car

Ford's Experimental XL-500



Plymouth's Research XX-500

Seen at Chicago

Reawakening public interest in luxury lines and sports car design is evident in new automobiles displayed at the Chicago Automobile Show, Mar. 14 through 22. Packard returns to the custom field after 15 years, Nash plans limited production on its Pinin Farina designed sports cars, and Ford and Plymouth display frankly experimental models to test public reaction

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stylists wince, but the plain truth is that when you are in business to sell cars you have to put out a car to sell. And those touches, many have learned the hard way, sell cars. If the chrome and gadgets are offered as accessories, they are installed anyway by the average buyer, so they might as well be put on at the factory.

However, these are probably somewhat feminine lures. Catering to the typical male is another sort of deal.

He Likes Power—Horsepower is a magic word to Joe Doakes. When he raises the hood he may mistake the air cleaner for the motor, but he knows exactly what horsepower is. It is directly related to brushing off an occasional smart aleck at a stop light and the indisputable hallmark of a superior machine. Few automakers have tried to discourage this belief, so torque, to the average motorist, has something to do with the string wrapped around a yo-yo if he has heard of the word at all.

Along the mechanical superiority lines comes the field of "stock" car racing. Hudson, Oldsmobile, Lincoln and probably Dodge this year are hard at work developing such "accessories" as a special line of rear-end ratios for "mountain driving" and souped-up engines for "police use." Beefed up springs, shocks, axles and hubs are available presumably for heavy-set people who like to drive over washboard roads.

Clay Smith, a top racing mechanic who prepared the Lincolns for the Mexican Road Race, told STEEL the bodies were virtually immobile on the chassis. Result was a machine that rode like a buckboard but cornered superbly. Lincoln placed one, two, three and four in the race, and you can get a Lincoln just like that if you're the outdoor type, masochistically inclined or plan to use it exclusively for road racing.

Special Jobs—A new "proving-ground" is opening up at Indianapolis. Cadillac, Chrysler and Lincoln engines are being prepared for a new class of cars to compete in the event. Ostensibly, the factories have no part in the specially ground cams, fuel injectors and horsepowers around 400 that are being developed. But you can bet your bottom dollar they're counting every single rpm and accepting a heck of a lot of anonymous collect phone calls in their engineering departments these days.

Once again, the establishment of prestige is bound to give the brand a lift, even if the engines and cars are similar to the truly stock item in name only. And the man in the street will go on paying his way into auto shows to point out the things that make his choice of a blooper wise, while those who buy any other brand will surely end up with throat scratch.

As one automaker put it, "Human nature is a peculiar thing, but it keeps us in business." And human nature, indeed, is staying in line for 1953.

Auto, Truck Output

U. S. and Canada

	1953	1952
January	612,829	409,406
February	623,530*	467,691
March	.....	517,207
April	.....	576,505
May	.....	546,673
June	.....	560,947
July	.....	246,461
August	.....	293,722
September	.....	592,253
October	.....	645,862
November	.....	556,366
December	.....	569,696
Total	.....	5,989,121

Week Ended	1953	1952
Feb. 14	147,103	111,821
Feb. 21	161,860	110,542
Feb. 28	167,779	118,397
Mar. 7	158,825	115,126
Mar. 14	166,833	120,392
Mar. 21	165,000*	125,347

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary

Packard on the Make

Packard, under the vigorous leadership of James J. Nance (Hotpoint) is aiming at Cadillac's position in the top luxury sales slot.

The statement would not rattle many electrically operated windows were it not for the fact that at the peak of its "class cars" popularity in 1935 Packard had more different models than there are makes of cars produced today. And the formula that worked for Packard in 1935 is being revived under James Nance's direction.

Today when a man has arrived, he buys a "luxury car." Usually he has not driven more than a block when he meets two or three other men driving identical cars. That sort of situation takes much of the kick out of "arriving" automotive-wise, and it is exactly this problem which was Packard's bread and butter. Packard will continue to make the Clipper, its middle-priced line. But the name Packard will once again become associated with distinctive top luxury cars.

Fancy Models—As a "starter," Packard is going back into the manufacture of an elegant town-car, limousine and combination town-car and limousine. The first were shown at the Chicago auto show. It is going to bring out a coupe de ville body later this year. A Monte Carlo-style coupe de ville (landeau) is being exhibited to show what to expect from Packard. Also on the drawing boards is a super-chromed razzle-dazzle type convertible with production possible in less than a year. And more than likely the 1955 models will have one of the hottest new V-8 engines to hit the market in some time.

By 1960 Packard expects to have cars entered in every price line except the low-priced field. It will sell cars at prices slightly higher than the Buick Special under such phrases as "You get much more for a little more." Buick, needless to say, won't be caught sleeping.

Fire—Some of Nance's fire has caught in the 1953 Packard line. A week spent driving a Packard Mayfair reveals that the car is velvet-smooth steady on the road at indicated cruising speeds of 80-90 miles per hour, has excellent torque at 50-60 where it's needed most and is a remarkably easy car to handle in traffic.

Interiors are spacious, lavish and comfortable. Ride was not uncomfortable even over the Belgian-type cobblestone roads in the Detroit area. Ultra-matic transmission is somewhat sluggish at slow speeds in the "high-range" but for quick starts a drop down to "low" with return to high at about 40 miles an hour leaves nothing to be ashamed of in the dig-in-and-go department.

Growing With You...for You

Twelve years have seen a tremendous growth from the small mill which originally housed our Steel Division to its present diversified operation. But though our growth has been rapid, we have just barely kept pace with demand. Today Copperweld is rushing to complete an extensive expansion program to increase its furnace and rolling capacity. Tomorrow we will be able to assure you even larger quantities and prompter delivery on Aristoloy Steels.

ARISTOLOY STEELS

STANDARD STRUCTURAL ALLOY • BEARING QUALITY ALLOY TOOL • SPECIALTY • NITRALLOY • CARBON TOOL • AIRCRAFT QUALITY

Hot Rolled • Forged • Annealed • Heat Treated • Normalized Straightened
Cold Drawn • Machine Turned • Centerless Ground

COPPERWELD STEEL COMPANY
WARREN, OHIO

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P. O. Box 1633, Tulsa, Oklahoma
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Monadnock Building, San Francisco 5, Calif.
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Sell Your Scrap...

Do you make these parts?

1. Diesel injection pumps
2. Lathe centers
3. Slitting rolls and knives
4. Cam rollers for automotive steering gears
5. Machine tool parts
6. Pump parts
7. Aircraft engine parts
8. Mechanical seals
9. Saw mill rollers
10. Ball bearings
11. Asbestos disintegrators
12. Mill rolls

Then you need 52100 steel!

52100 is the ideal steel for parts like those listed above, because it's hard, tough, yet easy to machine! 52100 has outstanding advantages for a wide variety of machined parts where great strength and exceptional wear-resistance are essential.

A high-carbon analysis alloy steel, 52100 has extreme hardenability throughout its cross section. It has high tensile and fatigue strength. Fully spheroidized structures make machining easier. 52100 steel will withstand a working pressure of 200,000 p.s.i. and can be oil quenched to a maximum hardness of 65/66-Rockwell C.

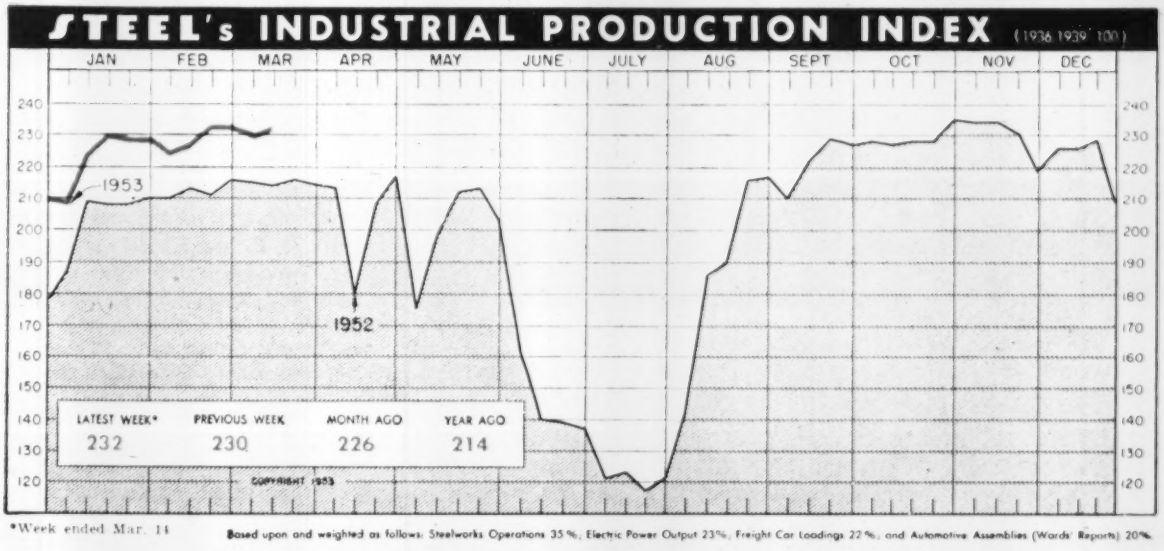
The Timken Company is one of the world's largest producers of 52100 and the *only* source of 52100 steel in three finished forms—bars, tubes and wire. For small run or emergency requirements, the Timken Company maintains a mill stock of 101 sizes in 52100 tubing—from 1" to 10½" O.D. And you're assured of uniform quality in every shipment because of the Timken Company's rigid quality control at every step in production.

For a stock list of available sizes, grades and finishes, write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING

The Business Trend



*Week ended Mar. 14

Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automotive Assemblies (Wards' Reports) 20%.

Metalworking companies are piling their inventories higher as demand rises for consumer durables. Burst of automotive operations shoves index upward

BUSINESS WILL probably remain near today's high levels through the next two or three months. That's what many executives in the metalworking industry are predicting.

Another sign of optimism is that inventories of durables are continuing to rise, without a drop in demand. The Commerce department's Office of Business Economics says that manufacturers' inventories of durables on Feb. 1 totaled around $24.2 billion, or nearly 5 per cent over durables stocks at the same date in 1952.

Supplies Improve—This over-the-year growth is particularly remarkable considering the materials situation. Most metals and metal products in the year ended Feb. 1 became increasingly more available. While many steel and other items were, and are still, in tight supply, the availability picture is improving quickly for most other metals and metal products.

Yet few manufacturers expect to be caught in the next few months with their inventories up. Defense production is remaining firm and demand for consumer products seems to be increasing all the time. Most companies depending on strong spring markets are saying that demand is taking the expected upturn. Optimism is particularly high among automotive companies and producers of household appliances.

Index—Reflecting the high rate of output, STEEL's industrial production index in the week ended Mar. 14 totaled 232 per cent of the 1936-1939 average. The current level is only 4 points under the record attained in the final week of October, 1952. Automotive operations, after declining in the previous week, supplied the main boost in the index by climbing slightly above the level reached two weeks earlier. Steel production and freight car loadings rose slightly in the week ended Mar. 14, while electricity output continued on its seasonal downtrend.

Another Record for Steel . . .

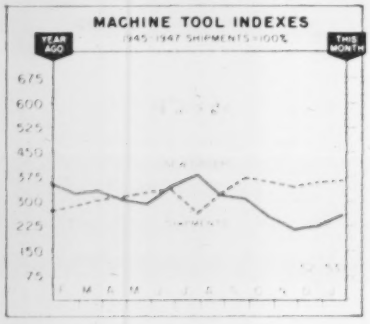
Smashing output records is becoming a common occurrence in the steel industry as producers rush new facilities into operation. The American Iron & Steel Institute says that furnaces in the week ended Mar. 14 set a new output record for the second successive week by pouring 2,284,000 net tons of steel for ingots and castings. Production in the week ended Mar. 21 is estimated at 2,256,000 tons.

Auto Sales in High Gear . . .

The passenger car industry is bending every effort towards increased production as customers snap up vehicles displayed in dealers' showrooms. Retail deliveries to customers in February (despite the shortness of the month) probably rose above 400,000 units and may have surpassed January's 420,390 vehicles, the highest sales since 1951, says *Ward's Automotive Reports*.

With demand at high levels, auto companies are now well into a production race. U. S. plants in 1953 by Mar. 14 rolled out an estimated 1.2 million passenger cars, compared with 785,000 units in the comparable period in 1952. If daily rates continue at the present clip, the first quarter will net upwards of 1,510,000 cars. Even higher turnout in the April-June period is expected to bring the first-half output to an estimated 3.2 million passenger vehicles.

Shadows are being cast over assembly lines, however. The industry is wondering if it can get the steel needed to sustain the projected output. Demand is particularly strong for cold-rolled steel sheets for bodies, hot-rolled sheets for

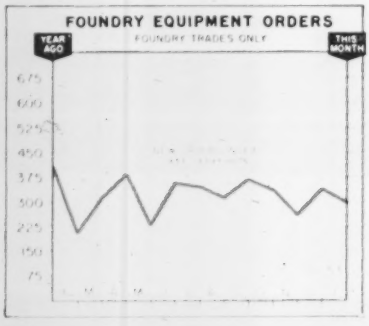


Machine Tool Indexes

1945-1947 Shipments=100

	New Orders		Shipments	
	1953	1952	1953	1952
Jan.	254.9	347.8	361.9	266.6
Feb.		318.8		279.6
Mar.		324.3		299.5
Apr.		293.5		307.9
May		284.6		323.0
June		342.9		330.8
July		376.3		259.7
Aug.		311.1		317.0
Sept.		302.4		368.3
Oct.		242.3		357.8
Nov.		266.4		342.5
Dec.		225.2		304.2

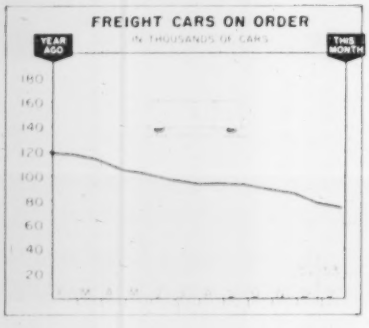
National Machine Tool Builders' Assn.



Foundry Equipment Orders

	Index (1935-1939 = 100)		Value, Thousands	
	1953	1952	1953	1952
Jan.	301.0	404.5	$1,379	$1,862
Feb.		200.1		922
Mar.		310.0		1,427
Apr.		385.1		1,773
May		225.2		1,037
June		353.8		1,629
July		243.9		1,583
Aug.		311.6		1,434
Sept.		365.9		1,685
Oct.		333.8		1,538
Nov.		258.1		1,183
Dec.		343.3		1,573

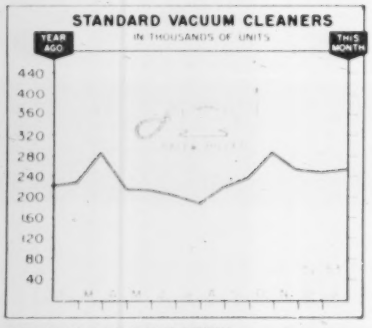
Foundry Equipment Mfrs. Assn.



Freight Car Awards and Backlogs

	Awards		Backlogs*	
	1953	1952	1953	1952
Jan.	5,536	5,338	77,414	120,251
Feb.	2,284	7,368	71,883	118,900
Mar.		5,619		115,854
Apr.		397		108,270
May		2,502		103,910
June		3,264		99,615
July		1,536		95,265
Aug.		4,408		95,761
Sept.		3,628		95,377
Oct.		1,423		90,708
Nov.		2,878		87,657
Dec.		1,159		86,296
Total		37,261		

* End of month.
American Railway Car Institute



Standard Vacuum Cleaners

Sales Billed—Units

	1953	1952	1951
Jan.	255,886	223,357	282,305
Feb.		230,226	261,572
Mar.		290,092	290,242
Apr.		217,169	227,216
May		216,969	201,983
June		206,939	194,548
July		188,715	161,002
Aug.		222,413	191,299
Sept.		237,541	210,086
Oct.		292,474	259,469
Nov.		254,297	219,919
Dec.		249,032	230,263
Total		2,841,803	2,729,104

Vacuum Cleaners Mfrs. Assn.

Charts Copyright 1953 STEEL

Issue Dates on other FACTS and FIGURES Published by STEEL

Construction	Feb. 23	Ironers	Mar. 9	Ranges, Gas	Feb. 23
Durable Goods	Mar. 9	Indus. Production	Feb. 16	Refrigerators	Feb. 2
Employ., Metalwk.	Jan. 18	Malleable Castings	Mar. 16	Steel Castings	Mar. 16
Employ., Steel	Dec. 15	Prices, Consumer	Jan. 26	Steel Forgings	Mar. 16
Fab. Struc. Steel	Feb. 9	Prices, Wholesale	Jan. 26	Steel Shipments	Nov. 3
Furnaces, Indus.	Feb. 2	Pumps	Feb. 16	Wages, Metalwkg.	Mar. 9
Gear Sales	Mar. 9	Radio, TV	Feb. 2	Washers	Feb. 23
Gray Iron Castings	Mar. 16	Ranges, Elec.	Feb. 2	Water Heaters	Feb. 23

frames and hot-rolled bars between one and two inches in diameter for forgings.

After a brief lull in the previous week, automotive production in the second week in March jumped up to the levels attained in the final week of February. U. S. and Canadian plants in the week ended Mar. 14 completed 166,833 passenger cars and trucks, or 8008 units over the previous week. In the week ended Mar. 15, 1952, combined U. S. and Canadian production totaled only 120,392 passenger autos and trucks. STEEL estimates that U. S. and Canadian output in the week ended Mar. 21 totaled 165,000 passenger cars and trucks.

Freight Car Orders Plunge . . .

Freight car builders are finding that their unfilled orders are dwindling rapidly as new orders amount to only a fraction of car deliveries. The Association of American Railroads says that deliveries of new domestic freight cars in February totaled 7780 units, compared with 2284 cars ordered that month. On Mar. 1, car builders had awards for 71,883 cars on their books, compared with a 118,900 unit-backlog on Mar. 1, 1952 (See chart, left).

Aircraft Orders Soaring . . .

While new orders for most defense products are leveling out, military procurement offices are stepping up their awards to the aircraft industry. The Bureau of the Census reports that unfilled orders for aircraft on Jan. 1 amounted to $17,662 million, or 39 per cent over the industry backlog, a year earlier. New orders for aircraft placed in the fourth quarter of 1952 totaled $3714 million or 9 per cent greater than sales during the same three months. New orders for aircraft propellers, however, were 26 per cent less than sales in October-December, 1952.

Business Picture Sunny . . .

Business will probably remain good throughout the first half of 1953. That's the consensus of the industrial buyers surveyed by the Business Survey Committee of the Purchasing Agents of Chicago.

Production in the first two

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	101.0	101.0	101.5
Electric Power Distributed (million kwhr)	8,138	8,173	7,414
Bituminous Coal Output (daily av.—1000 tons)	1,368	1,408	1,646
Petroleum Production (daily av.—1000 bbl)	6,450[1]	6,440	6,405
Construction Volume (ENR—millions)	$266.2	$273.7	$223.8
Automobile, Truck Output (Ward's—units)	166,838	158,825	120,392
TRADE			
Freight Car Loadings (unit—1000 cars)	690[1]	685	709
Business Failures (Dun & Bradstreet, number)	165	180	156
Currency in Circulation (millions)[3]	$29,780	$29,772	$28,452
Dept. Store Sales (changes from year ago)[3]	+8%	+9%	−11%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$16,540	$19,056	$15,515
Federal Gross Debt (billions)	$267.5	$267.6	$260.2
Bond Volume, NYSE (millions)	$17.1	$17.8	$14.6
Stocks Sales, NYSE (thousands of shares)	8,537	8,844	6,947
Loans and Investments (billions)[4]	$76.6	$76.7	$73.4
United States Gov't. Obligations Held (billions)[4]	$30.8	$31.0	$31.7
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	181.31	181.31	171.92
STEEL's Nonferrous Metal Price Index[6]	225.1	223.6	243.6
All Commodities[7]	109.9	109.9	113.0
All Commodities Other Than Farm and Foods[7]	113.1	113.2	114.3

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1953, 2,254,459; 1952, 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

months of 1953 stood at a high level, although somewhat under the latter part of 1952, they report. Nevertheless, profits in January and February rose over the preceding two months, since fewer dollars were spent on over-time pay and most operations were run more efficiently. Inventories increased in the first two months, but haven't approached a top-heavy position.

One key indicator has turned down, however. Buyers report that their unfilled orders have tapered off; this is the first backlog decline since July, 1952. This order dip, says the association, may be only temporary.

Retail Volume Booming . . .

Confirmation of the high rate of consumer demand is indicated in the Commerce department's monthly retail report. The department's tabulation shows that total sales volume of retail stores in January rose 11 per cent over the first month in 1952. Sales of automotive dealers rose 29 per cent, while stores in the furniture and appliance group rose 11 per cent over the year. Stores devoted to both appliance and radios pushed sales up 9 per cent. Department store sales in January rose 3 per cent over a year ago. At present, says the Federal Reserve Board, department store sales have climbed 8 per cent over the comparable weeks of last year.

Demand Cools for Stokers . . .

One probable result of the bituminous miners' wage hikes last year is the sharp drop in stoker sales. The Bureau of the Census reports that factory sales of mechanical stokers in January dropped 26 per cent over the year to 110 units. Sales of bituminous stokers dropped 33 per cent from a year earlier, while anthracite stoker sales declined about 2 per cent.

Trends Fore and Aft . . .

Production of bituminous coal in 1953 to date is lagging about 21 per cent under the same period in 1952 . . . Contract awards for heavy construction in 1953 are about 38 per cent over a year ago . . . "Machine tool deliveries are, in the main, back to normal for the first time since Korea," says National Machine Tool Builders' Association . . . Consumer prices in January marked the first decrease over a 12-month period, says the National Industrial Conference Board . . . Bank clearings in January rose 3 per cent over January, 1952.

Headquarters for

52100

Steel Tubing and Bars

Largest Stocks in the Country

of this versatile steel. 52100 is hard, tough and long-wearing, yet it's easy to machine and is right for bearings, sleeves, pins, collars and many other machine parts.

Over 200 seamless tube sizes to choose from .898" O.D. to 8.250" O.D. Bar sizes from .171" round to 7.5" round. Also ring forgings in any analysis.

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New Headquarters of Peterson Steels, Inc., Union, New Jersey

PETERSON STEELS, INC.

DEPT. S, SPRINGFIELD ROAD
UNION, NEW JERSEY

Detroit, Mich. • Chicago, Ill.

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Making light work of heavy-duty fastening ...with 57% savings!

G & O Manufacturing Company, New Haven, Conn., solves major fastening problem with 100% switch to Tinnerman SPEED GRIPS!

Here's how this famous maker of truck and heavy equipment radiators went right to the "core" of soaring production costs. G & O engineers specified SPEED GRIPS to replace the old method of welding nuts to radiator side panels for a big 57% assembly savings! In addition, this led to a big reduction in materials handling...eliminating costly shipping and servicing of units returned for repair due to weld breaks! Also eliminated was the need for expensive welding equipment, allowing the shift of skilled manpower to other production jobs!

For a new look at the savings potential in your fastening methods, call your Tinnerman representative. He'll give you details on our FREE Fastening Analysis Service.

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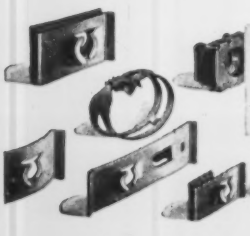
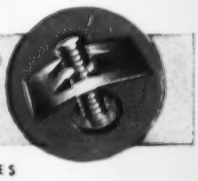
...replace welded nuts on the G & O radiator side panels as shown above . . . snap into bolt-receiving positions by hand...are ideal for use in blind locations, require no welding, clinching or staking; "float" prevents cross threading due to misalignment of holes. Available in a complete range of sizes to meet your needs.

Write today for your copy of "SPEED NUT Savings Stories", a booklet of typical SPEED NUT savings to industry: TINNERMAN PRODUCTS, INC., Box 6688, Cleveland 1, Ohio. *In Canada:* Dominion Fasteners, Ltd., Hamilton, Ont. *In Great Britain:* Simmonds Aerocessories, Ltd., Treforest, Wales. *In France:* Aerocessoires Simmonds, S. A., 7 rue Henri Barbusse, Levallois (Seine).



TINNERMAN Speed Nuts®



MORE THAN 8000 SHAPES AND SIZES

Men of Industry

WILLIAM H. ROBERTS
. . . Detroit Stamping v. p.-sec'y

HARRY E. BEANE
. . . v. p.-sales, Bristol Co.

RUSSEL B. CAPLES
Anaconda Aluminum president

Detroit Stamping Co., Detroit, elected **William H. Roberts** vice president and secretary to succeed **John Beck** and **H. G. Roberts**, who have served as these respective officers in a semiactive capacity in recent years. W. H. Roberts has been manager, finished products division, since 1945.

Ohio Crankshaft Co., Cleveland, appointed **Chester H. Kimmel** vice president and general manager. He joined the company in 1940 as factory manager of the crankshaft and camshaft division. In 1946 he became general manager of this division and in May of last year was elected a vice president.

William Goodrich becomes factory manager, **Louis O. Taber** customer service manager, and **Arthur Hazeldine** production control manager in promotions at **Die Supply Co.**, Cleveland. Mr. Goodrich, formerly superintendent of tools and equipment, now is responsible for engineering, production and quality control in the manufacturing of both Dieco stock-size and special die sets.

Charles T. McClure, formerly with Youngstown Steel Products Co. of California, joined **Youngstown Sheet & Tube Co.**, Youngstown, as superintendent of field engineers, tube division.

Harry E. Beane was appointed vice president of sales, **Bristol Co.**, Waterbury, Conn. He joined the Bristol sales engineering organization in 1920, served in various administrative capacities, and was made general sales manager in 1947.

At the Norwood, O., Works, **Allis-Chalmers Mfg. Co.**, **J. J. DeWindt** and **G. C. Vogel** were named assistant works manager and general superintendent, respectively. At the Boston Works, **J. P. Kelley** was named works manager, succeeded by **J. L. Desmond** as superintendent of production. Mr. Desmond continues as traffic manager.

Dr. Ralph A. Schaefer was elected vice president in charge of materials development at **Clevite-Brush Development Co.**, Cleveland. He has been director of research at Cleveland Graphite Bronze Co., a unit in the Clevite group of companies. **William P. Short**, formerly vice president-operations for Pleasantville Instrument Co., joins Clevite-Brush as director of piezoelectric and sonic products development.

William Curran has been appointed vice president in charge of operations, **National Roll & Foundry Co.**, Avonmore, Pa. **Robert B. Eberle Jr.** becomes treasurer.

Russel B. Caples was elected president and director of **Anaconda Aluminum Co.**, subsidiary, Anaconda Copper Mining Co. He will have headquarters in New York and will continue to manage the zinc contract negotiations for Anaconda's Montana zinc plants. Mr. Caples succeeds **Francis O. Case**, resigned to head Glen Alden Coal Co. as president.

Walter J. Holder was appointed assistant to the general sales manager, **Honan-Crane Corp.**, Lebanon, Ind., a subsidiary of Houdaille-Hershey Corp. He previously was with the radiator division of General Motors Corp.

Andrew F. Kritscher was appointed assistant chief engineer, process development, **National Tube Division**, U. S. Steel Corp., Pittsburgh. He has been development engineer.

James A. Jordan, for 18 years traffic manager for Cosby Hodges Milling Co., Birmingham, has accepted a similar position with **Ingalls Iron Works Co.**, Birmingham.

Harry J. Hater resigned as president of **Aluminum Industries Inc.**, Cincinnati, but remains as a director. **Eugene F. Eckerle**, vice president and general manager, will carry on duties of executive officer.

At **Clinton Machine Co.**, Maquo-

keta, Iowa, **Jim Davidson** was appointed to the newly created post of director of sales and service. **Clete Erlacher** was made sales manager, and **Ray Oehler** service manager.

Donald W. Lloyd, general superintendent of Brier Hill Works, **Youngstown Sheet & Tube Co.,** was appointed general superintendent of the company's steel plant at Indiana Harbor, East Chicago, Ind., to succeed the late **George W. Abel. Thomas B. Carpenter** succeeds Mr. Lloyd, and is replaced by **James W. Kirkpatrick** as superintendent, Brier Hill open-hearth department. **Ernest B. Plott** becomes chief metallurgist in the Youngstown district.

Burton R. Buck was appointed works manager, **Electro Metallurgical Co.,** a division of Union Carbide & Carbon Corp., New York. He joined the company in 1934 and has been assistant works manager since 1951.

R. C. Somerville was elected vice president in charge of sales and a director of **Dodge Brothers Corp.,** Detroit, subsidiary, Chrylser Corp. **L. F. Desmond** was made general sales manager.

Pittsburgh Engineering & Machine Co., Glassport, Pa., appointed **G. W. Linkhauer** vice president in charge of operations and **P. J. Castora** vice president in charge of engineering and sales.

G. W. LINKHAUER
. . . a v. p., Pittsburgh Eng. & Machine

R. S. INGERSOLL
. . . a v. p. at Borg-Warner Corp.

L. G. PORTER
. . . a v. p. at Borg-Warner Corp.

At **Borg-Warner Corp.,** Chicago, **R. S. Ingersoll,** president of Ingersoll Products Division, was elevated to an administrative vice presidency of the corporation. **L. G. Porter,** Borg-Warner treasurer, becomes administrative vice president and treasurer. **Robert W. Murphy,** general counsel, was elected vice president and general counsel. Mr. Ingersoll, in addition to his new duties, retains the presidency of Ingersoll Products Division, Reflectal Corp. and Petro-Mechanics Research Division.

Inland Steel Co., Chicago, appointed **Robert E. Gentz** director of management development, a new position at its Indiana Harbor Works. He is replaced as superintendent, sheet and galvanizing department, by **Robert W. Rost,** transferred from the Jersey City, N. J., plant, container division. **R. D. Satterley** was appointed manager of iron ore mines and **Howard M. Graff** assistant manager. **Curtis W. Burr** was made assistant sales manager, plant and shape division.

J. P. Kay was appointed central western representative for **H. H. Buggie & Co.,** Toledo, O.

Price Davis is manufacturers' representative for **Horton Chuck Division,** E. Horton & Sons Co., in Wisconsin. He operates his own business as a manufacturers' agent in Milwaukee.

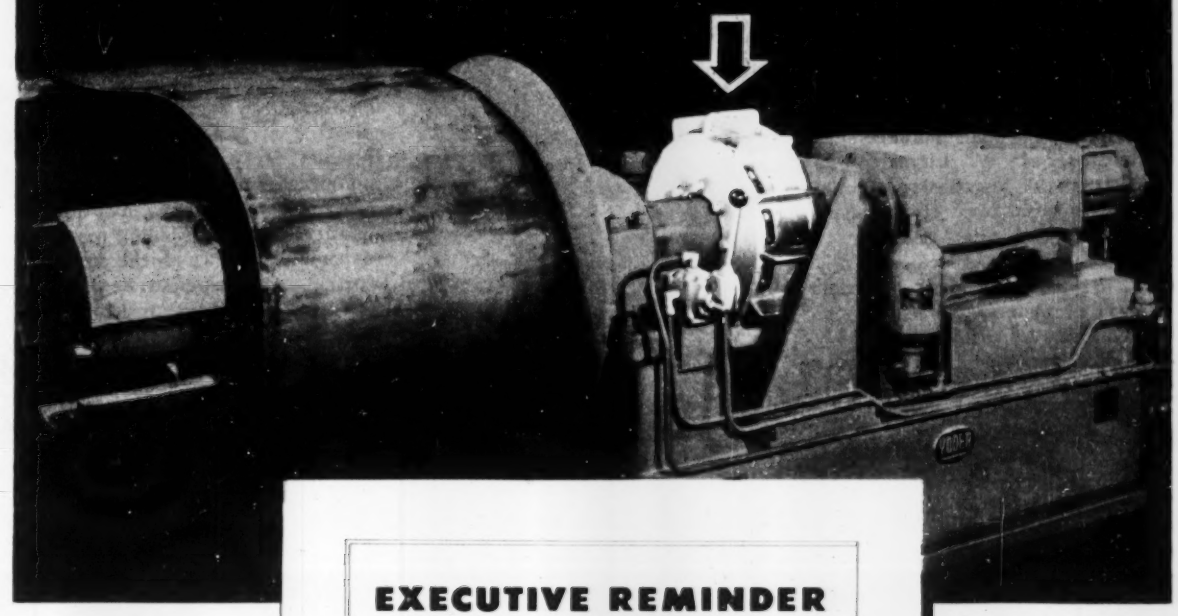
Herbert A. Gumz was appointed executive vice president and **Norman C. Owen,** vice president in charge of sales, **Webster-Chicago Corp.,** Chicago. Mr. Gumz has been vice president and acting general manager, and Mr. Owen was general sales manager.

H. R. Lobdell was elected vice president in charge of production and field service, **Machinery Mfg. Co. Inc.,** Los Angeles. The firm is a subsidiary of Bivans Corp. and markets Tuck-O-Mat and Convey-O-Mat carton set-up machines.

Harnischfeger Corp., Milwaukee, appointed **Curtis Meyer** sales manager, electric hoist division. He previously was a director and vice

P. J. CASTORA
. . . a v. p., Pittsburgh Eng. & Machine

TYPICAL EXAMPLE OF FAWICK BRAKE APPLICATIONS IN MODERN PROCESSING MACHINES



Uncoiler of Yoder Slitting Line equipped with FAWICK Type E BRAKE on the mandrel shaft.

EXECUTIVE REMINDER FOR SIMPLIFIED PROCESSING

Possibly no power transmission component can add more to the efficient operation of your processing machines than FAWICK AIRFLEX CLUTCHES AND BRAKES.

Their rugged design and simple operation are continuously providing thousands of installations with new high standards in production speed and accuracy, safety, and operating efficiency.

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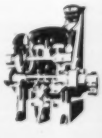

OTHER FAWICK APPLICATIONS IN STEEL PROCESSING

FAWICK Airflex

INDUSTRIAL CLUTCHES AND BRAKES

president-sales with Milwaukee Electric Tool Corp.

Hevi Duty Electric Co., Milwaukee, appointed **J. J. Farrell** district manager of the West Coast office located in Van Nuys, Calif.

W. A. Morris Jr., formerly director of purchases, was named to the new post of vice president of purchases at **Jones & Laughlin Steel Corp.**, Pittsburgh, and was also named to the management committee. **J. W. Lindsey** was made general purchasing agent; **A. N. Johnston**, formerly purchasing agent, was named assistant to the vice president-purchases; and **C. L. Brinker** was made assistant general purchasing agent-raw materials. **H. W. Graham**, formerly vice president-technology, becomes vice president-research. **D. T. Rogers** becomes director-technical services.

Jerome J. Theobald of Skaneateles, N. Y., was made sales representative for **Gries Reproducer Corp.** to cover New York state exclusive of the metropolitan area.

Harry F. Devens and **Edward W. Sherman** were appointed assistant sales managers of the metals division of **Olin Industries Inc.**, East Alton, Ill.

George K. Dreher resigned as executive director, Foundry Educational Foundation, Cleveland, to join **Waukesha Foundry Co.**, Waukesha, Wis., effective May 1. He will be succeeded as FEF executive director by **Edward J. Walsh.**

THEODORE W. HAGER
. . . president, Peter A. Frasse & Co.

Peter A. Frasse & Co. Inc., New York, elected **Theodore W. Hager** president. **Lester Brion**, who headed the company for many years, was elected to the newly created office of chairman of the board. **Clarence A. Warden Jr.** of Philadelphia was elected a director.

Thomas P. Kennedy, director of the Racine county pension department, resigned to become purchasing agent of **Haas Foundry Co.**, Racine, Wis.

Robert W. Hunt Co., Chicago, elected **H. H. Morgan** president and **W. J. Bongard** vice president.

A. A. Agnew is now associated with the St Louis office of **Hyman-Michaels Co.**

The headquarters manufacturing division of **Westinghouse Electric Corp.**, Pittsburgh, has been reorganized: **C. G. Wallis**, former manager of the headquarters department, now serves as assistant to the vice president. **L. S. Houk** was named director of works engineering; **N. H. King** and **R. I. Wilson**, director and assistant director, respectively, of production and inventory control; **G. C. Moore**, director of plant industrial engineerjng; **V. D. Mack**, supervisor of manufacturing student training; and **Joseph Manuele**, director of quality control. Heading up a new department known as the manufacturing and equipment engineering is **Edward Griffiths**, director of expense control, **W. H. Dickerson**, director of manufacturing engineering, and **G. P. Longabaugh**, equipment engineer.

Chet W. Froude and **Charles P. Evans**, general managers of **Arrowhead Rubber Co.**, subsidiary, National Motor Bearing Co. Inc., at Long Beach and Downey, Calif., respectively, were elected vice presidents.

William Rodgers was named general sales manager, **Blaw-Knox Co.**, Pittsburgh, effective Apr. 1. This is a new staff post in which Mr. Rodgers will co-ordinate sales activities for all divisions of the company, as well as assist in developing sales objectives, policies and programs.

George W. Drysdale, vice president-manufacturing, **Briggs Mfg.**
(*Please turn to Page* 99)

OBITUARIES...

Robert H. Gardner, 58, general sales manager of **A. M. Byers Co.**, Pittsburgh, died Mar. 9 after a brief iiiness. He joined the company in 1933.

Rudolf Nagel, 63, chief engineer, heavy materials handling division, **Heyl & Patterson Inc.**, Pittsburgh, died recently.

Anthony Siragusa, 53, purchasing agent, nonferrous metals, **United States Steel Corp.**, Pittsburgh, died Mar. 15.

Anthony A. Mulac, 74, president and general manager, **Buckeye Twist Drill Co.**, Alliance, O., until the concern moved to Chicago a number of years ago, died Mar. 15.

Clyde S. Bergert, 62, manager, shelving sales department, **Berger Mfg. Division**, Republic Steel Corp., Canton, O., died Mar. 10.

R. K. LeBlond, 88, chairman of the board of **R. K. LeBlond Machine Tool Co.**, Cincinnati, died Mar. 17.

Andrew C. Krein Sr., 62, executive vice president, **Bastian-Blessing Co.**, Chicago, and associated with the company 43 years, died Mar. 13.

Charles G. Curtis, 92, inventor of the gas turbine and president, **International Curtis Marine Turbine Co.**, New York, died Mar. 10.

Sylvester Stroinski, 48, president and founder of **An-Kor Plating Rack Co. Inc.**, Cudahy, Wis., died Mar. 14.

Harry H. Weiss, 55, president, **Brady Conveyors Corp.**, Chicago, died Mar. 5.

George A. Wutt, 59, president, **Keystone Bolt & Supply Co.**, Los Angeles, died Mar. 2.

Edwin N. Hickman, 62, vice president and a director of **American Metal Co. Ltd.**, New York, died Mar. 9.

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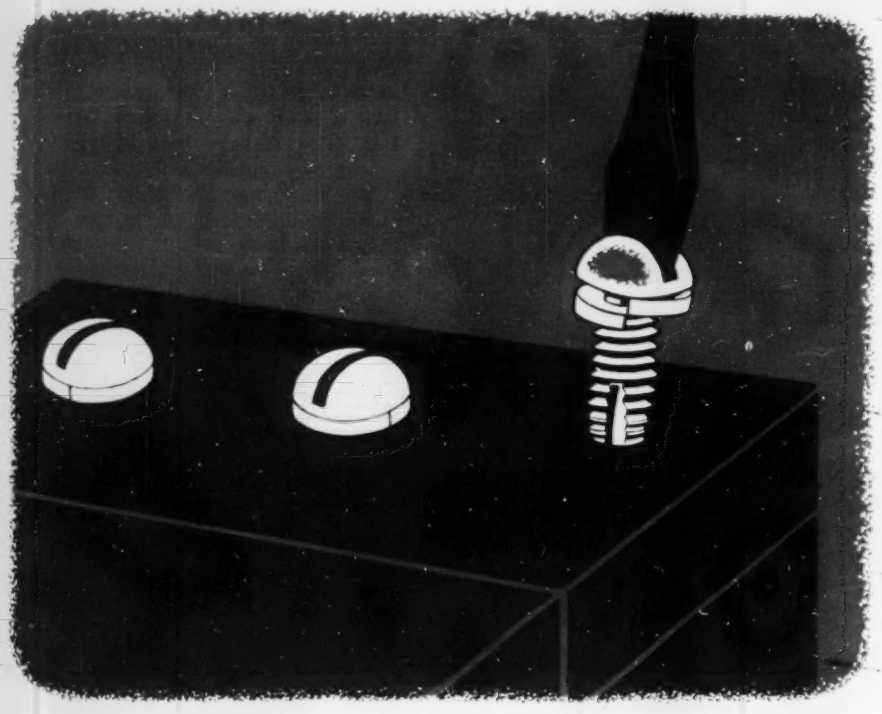

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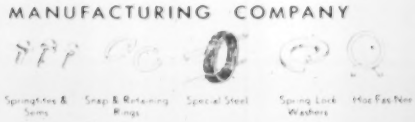

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Production AND Engineering NEWS AT A GLANCE

FUEL BY THE POUND—Many engineers remember the old-style gasoline pumps that after taking a beating from the sun's rays shortchanged the motorist. He was charged for the heat expanded fuel not for the actual useful amount in his tank. To a pilot of a jet airplane this problem is much more serious since his engine essentially converts pounds of fuel into thrust. Wide variations in density under different, fast changing conditions have made exact information unavailable to pilots on the weight of fuel entering engines until Gavco Corp., New York, came up with a midget electronic instrument that measures fuel in pounds per hour readings. Fuel density is measured to within one per cent accuracy and gives rate of fuel consumption regardless of such factors as pressure, velocity, humidity, viscosity and temperature.

TITANIUM MACHINING—Research data show you can machine titanium in your shop. It will, however, require some rugged tools and equally rugged machines. Elimination of vibration and chatter is a must. Of all the variables, speed and feed seem to be most critical. Surprisingly enough, the heaviest feed practical seems to be the best for many of the operations. Many other variables seem to make little difference. p. 76

HEARING CLICKS?—Your ears may not be playing tricks if you hear clicking noises as the number of radiation instruments is expanding rapidly. In just five years radiation instrument manufacture has rocketed to the point where it is a $20 million enterprise. More than 80 firms employing a total of 2400 workers are selling half their output to the military and the AEC, the rest goes to a variety of private businesses.

HIGHLIGHTS ON HEAT—Mass-production economy shows up in almost all surveys of induction-heating applications. Interesting point is that most applications are outside the field of surface hardening. Scale removal, heating for automatic forging, induction brazing are some of the new applications which have demonstrated rapid growth. Naturally in the field of heat treating, induction heating has made important strides. Tie-in with automation is one point in its favor. p. 80

DUCTILE POWDER METAL—A new iron powder metal introduced by Chrysler Corp.'s Amplex Division, has several times the ductility of previous iron powder products and makes possible new uses for the material. Its physical properties are comparable to mild carbon steel. Where iron powder parts for regular usage will withstand a pressure of about 35,000 psi, Steel Oilite withstands up to 70,000 psi. Since the metal isn't brittle it may be bent or twisted without breaking. The qualities of ductility and strength make it usable for finished machine parts like gears, cams, brackets and lever arms formerly out of iron powder's work range. While retaining some of its porosity, it is not intended for self lubricating applications.

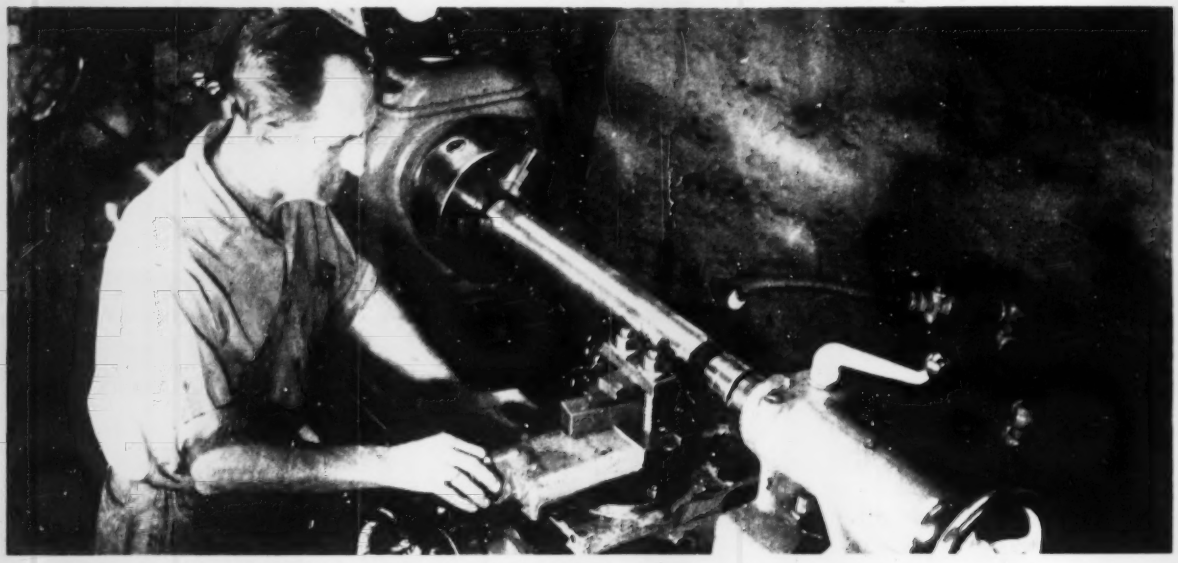
REAL SMOOTH—Maintaining uniformity of surface on a number of parts, accurately that is, is a job for highly trained men and a complicated electronic gadget. But that's going to be a thing of the past. Very shortly, an electronic instrument manufacturer will spring a surface indicator on the market which will be a production line tool. According to reports, the device will accurately tell whether a surface falls within the prescribed limits and do it almost independently of the operator's skill. This will be an important step in industry's constant attempt to exclude the human element from testing and standardization.

STAMPINGS WITHOUT WRINKLES—Use of a rubber-pad process for small-lot stampings is a boost to production. Absence of wrinkles in the forming operation means elimination of separate wrinkle-removal job. Another plus on their side is the low cost of the dies and form blocks. p. 83

METALLIC SWEEPER—Faster pickup of tacks, nails, etc. from a variety of industrial locations is possible with a three-way magnetic road sweeper developed by Eriez Mfg. Co., Erie, Pa. It can be pushed by hand, towed behind a vehicle or suspended from the forks of an industrial truck. Only a few minor changes are needed to adapt it from a towed to a suspended unit.

MAGNETIC MATERIAL—A magnetic material composed of non critical metals developed by the Naval Ordnance Laboratory is named 16-Alfenol since its composition is 16 per cent aluminum and 84 iron. It isn't entirely new but previous applications weren't completely successful because of the metal's extreme hardness and brittleness. These properties also prevented efficient rolling into sheets. The Navy researchers developed a method for "cold" rolling it at 575 C and found the alloy could be formed into thin tapes showing desired magnetic properties. Cold rolling in this instance refers to the lack of change in the crystalline structure of the alloy rather than the temperature. When these thin strips were produced, it was found the alloy had become tougher and more ductile. The metal tapes showed isotropic magnetic properties and high bulk resistivity which prevented electrical losses. The metal also grew its own insulating layer when rolled, permitting elimination of one step in fabricating on some applications.

Metalworking Outlook—p. 39 *Market Outlook—p. 125*



Test cuts are taken on a Monarch 16-inch lathe. Titanium alloy bars are 1¼ inches in diameter by 24 inches long. Commercial grade bars are 1⅛-inches in diameter by 24 long. Both types were centerless ground in advance

Guideposts to Titanium Cutting

Research project for Kennecott Copper reveals some definite conclusions on titanium machining. The study points up need for improvement in cutting tools and fluids

By V. J. GAUTHIER
Associate Professor
College of Engineering
New York University
New York

YOU CAN machine titanium in your shop. It takes rugged tools and rigid machines. However, it's not a question of whether or not, but how efficiently the machining can be done.

This then resolves itself around the factor of tool life. Knowledge of how the many machining variables affect tool life will lead to a clearer picture of titanium's behavior as it faces a cutting tool.

First problem in the tool life picture is that of definition. With high speed tools cutting mild steel bars the tool wears mainly by cratering on the top surface or the surface in contact with the chip.

The Breakdown — The chip is continuous and ductile. Cutting edge and tool flank are protected by a built up edge of chip material, and remain undamaged until complete failure occurs.

As the crater on top gets bigger and deeper it approaches the cutting edge. Final failure is sudden, complete and easily observed by the machine operator.

Matter of Degree — With the same tool cutting on gray cast iron, the chips are segmental. Force on top of the tool is small and no appreciable cratering occurs. However, wear does occur down the side of the tool and is called flank abrasion.

End of the tool life is no longer sudden, well defined or easily observed. Instead there is a gradual increase in friction, heat and force on the tool. Life becomes a matter of choice and is based on the amount of allowable flank abrasion in thousandths of an inch.

Two-Faced—Excessive abrasion on the tool means more wear on the machine, poorer work surface and more grinding to repair the tool. With carbides there is a better balance between the types of failure, failure is not so sudden and the particular type of failure can be partially controlled by choice of carbide.

Titanium is unusual with respect to high speed steels. It gives a ductile type chip as would be expected from mild steel, but causes failure by flank abrasion as would gray cast iron.

No Protection—This is quite different from most metals that we machine. Apparantly the titanium built up edge is unable to protect the tool from flank abrasion. It doesn't mean that titanium does not cause cratering, but rather that in many cases the flank abrasion is more rapid and severe.

As a result of these considerations and from preliminary trials we chose a definition of tool life based on flank abrasion and used this as criteria of tool wear.

Close Enough—To measure this value a filar micrometer was used in conjunction with a 3.5 X micro-

scope objective. Wear was easily measured to 0.001-inch. Further accuracy would not be needed or justified. Measurement was made at the center of the side cutting edge.

Corresponding to the common use of cubic inches cut, we used in many cases "inches cut." This is simply the cubic inches divided by the chip dimensions of feed times depth. It is satisfactory for comparative purposes and allows use of whole numbers. In most tests a standard cut was used of 0.012-inch per revolution feed at 1/16-inch depth.

Cutting Fluids

Most of the fluids used are standard, commercially available oils in common use. Samples were chemically checked and the results listed. Emulsions were made up with water.

All tests were run with a temperature of 100° F in the lathe tank. Emulsions were made up with 5, 10 and 15 to 1 ratios and run under comparable conditions.

No Change—There was no appreciable difference in the tool abrasion. Any small variations in mixing the normal ratio would have no affect on test results. Flow of fluid on the lathe was calibrated and actual delivery to the tool was 4.9 gallons per minute. Machine tank holds 10 gallons.

We wanted to find out if moderate refrigeration down to 0° F would be of any benefit. Coolant tank and fittings were insulated and the 10 to 1 emulsion with 50 per cent Prestone was cooled with dry ice. Before each test, the cutting fluid was run over the work and the tool for several minutes to establish the lower temperature.

Temperature Results — Standard high speed tool was used at 20 sfm and run for 40 seconds or 160 inches. Feed rate was 0.012-inch per revolution at 1/16-inch depth of cut. Temperatures were measured at the tool position.

Results show no change whatever. Unless there is a sudden critical change below 0° F, there is not much hope for improved machining due to low temperatures unless very special equipment is used. Other investigators have reported improved machining by using liquid CO_2 or immersing the titanium in a liquid bath at as low as minus 100° F.

Seven different cutting fluids were then evaluated using the 18-4-1 high speed lathe tool. Cutting speed was 20 sfm, feed 0.012-inch with a 1/16-inch depth of cut.

Slight Drop—Compounding with 18.7 per cent lard oil has no practical effect. Effect of sulphurized and chlorinated oils showed up in our charts. There seems to be a definite lowering of abrasion in the commercial titanium by as much as 0.002-inch. The alloy grade is inconsistent and shows 0.001-inch more abrasion for the sulphurized oils. This small value, however, may be the result of experimental error.

Soluble oils are useful with carbide tools at high speed as well as with high speed tools at lower speeds. Our results with the emulsions on high speed tools show about the same order of effectiveness as the mineral oils.

Single Purpose — Several tools were run with straight carbon tetrachloride, but the abrasion was the same as for the ordinary cutting oils. Its value on steel is commonly attributed to chemical activity, but titanium is very resistant to attack by chlorides.

None of the cutting fluids tried were effective in reducing the severe flank abrasion on high speed steel. Their only value was as a coolant for the work and the tool.

Feeds and Speeds

Tool life is particularly affected by feed rate. A change from 0.035 to 0.003-inch per revolution will double the abrasion on the tool. For this reason it is good commercial practice to use as heavy a feed as possible.

Limitations to heavy feed are strength and rigidity in the machine and workpiece, as well as surface finish requirements. Our rather slender bars developed chatter at more than 0.24-inch. In heavy sections feeds of as much as 0.050-inch are sometimes used.

Breakdown—If the apparent machine feed is momentarily reduced to a small value by deflections or by an uncertain mechanical feed the large amount of abrasion may destroy the ability of the tool to cut. This can occur in a matter of 5 or 10 seconds with high speed tooling.

With the ordinary engine lathe type tool post, deflections allowed almost instantaneous abrasion of

VARIABLES: *How They Affect Titanium*

CUTTING FLUIDS—No significant difference found between ordinary commercial fluids. Temperature had little or no effect with water soluble fluids.

FEED RATE—Heavy feed rates are desirable for titanium machining. Rigidity in work and tooling is mandatory.

CUTTING SPEEDS—Generally, upper limit for HSS is 30 sfm. Carbide should be run at 150 sfm or higher. 300 sfm may be satisfactory in many cases.

TOOL ANGLES—HSS tools were not sensitive to small changes in angles. For turning, 6 to 8 degrees relief, 8 degrees back rake, 15 degrees side rake, 5 to 15 degrees side cutting edges and 3/64-inch nose radius.

Carbide tools were more affected by changes in tool angles. Keep rake angles close to zero. Negative rakes are undesirable; large positive rakes of over 8 degrees cause rapid decline in tool life.

CHROME PLATING—Chrome-plated HSS tools showed no improvement over standard tools.

TITANIUM CHIP SAMPLES

Comm. Ti
HSS; 20 sfm
0.012-inch/rev
depth—1/16-inch

Comm. Ti
HSS; 20 sfm
0.012-inch/rev
depth—⅛-inch

Comm. Ti
HSS; 20 sfm
0.024-inch/rev
depth—1/16-inch

the tool and subsequent rejection of the tool by the work. When the same tool and holder were set up on a ram type turret lathe, with a heavy block fixture on the cross slide no difficulty was encountered in cutting to the center of the same bars. Although abrasion was still severe, 5 to 10 bars could be cut with one tool grind.

Carbide Advantage—High speed tooling requires very low speeds in the range of 15 to 40 sfm. The higher value is excessive in most cases. Using a feed of 0.012-inch at 1/16-inch depth of cut we plotted curves for 15, 20 and 40 sfm. If 0.020-inch wear is allowed, twice as much metal can be cut at 15 sfm as at 40.

Carbide tools are recommended for all turning operations unless chipping of the cutting edge occurs from rough, scaly surfaces. They can be run at much higher speeds than high speed tools, and give much longer life due to their resistance to abrasion.

Further speed tests correlated the fact that nose temperature of the tool is higher at the higher speeds and most abrasion occurred out near the nose rather than uniformly along the side cutting edge.

Tool Angles

Rake and relief angles were investigated for 18-4-1 high speed tools using 20 sfm with 0.012-inch feed and 1/16-inch depth of cut. Back rake was held at 8 degrees in all cases. Almost no change took place when the side rake was varied from 5 to 25 degrees. These results are undoubtedly due to the critical part played by flank abrasion when machining titanium. Heavy feed rates or other changes affecting abrasion could change these results.

Tests were repeated and the side relief varied from 5 to 12 degrees. Deviation of 0.0015-inch in abrasion was considered negligible. Standard high speed tool used for all other tests was ground with 8 degree back rake, 15 degree side rake and 6 degree end and side relief. Nose radius was 3/64-inch in all cases and minor changes had no effect on flank abrasion. Side cutting edge angle was set at 5 degrees.

Zero Rake — The carbide tool holder provides for 7 degree relief angles and a 3/64-inch radius. These angles were left unchanged in all cases. Original rake angles were negative 7 degrees. The negative rake proved unsatisfactory. Abrasion along most of the cutting edge was small, but there was a pronounced tendency to form a V-shaped washout where the surface of the bar engaged the tool edge. This was in spite of the fact that the bar had been centerless ground and had no scale on the surface.

Rake was then changed to 0 degrees side and back and good results were obtained. When the side rake was increased to 5 degrees the tool life was cut in half. Rake angles should be small, positive and close to 0 degrees.

Cold Work

Titanium differs from most common metals in that a ductile chip is coupled with severe flank abrasion on the tool. Furthermore, cold work has long been known to alter the chip formation and machining characteristics of other alloys. It seemed possible that cold work might be used to change the machining of titanium to obtain a better balance between flank abrasion and cratering, thus achieving longer tool life.

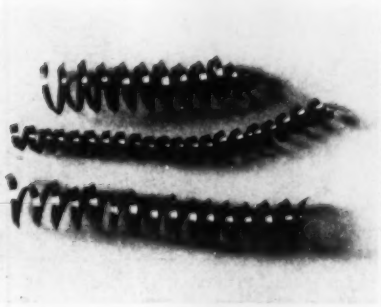
No Effect—The bars to be cold worked were first given an air anneal at 1200° F. This slightly oxidized the surface and prevented seizing in the dies. An extra bar was annealed but given no cold work, to provide a control over any other variables. Rockwell hardness checks were, before anneal—RA 59.15, after anneal RA 60, and after 9.5 per cent cold reduction RA 64.5.

Annealed and the cold worked bars were then run with the standard high speed tool at 20 sfm, 0.012-inch feed and 1/16-inch depth of cut. Cold work had no apparent effect on tool abrasion. Only the commercial titanium was used as the alloy grade could not be obtained with the cold reduction.

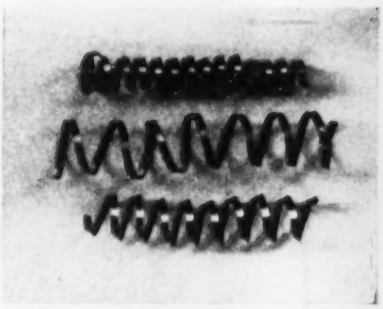
Cobalt High Sped Tools

Disappointing performance of 18-4-1 high speed tools led us to try cobalt high speed tools. Same tool angles and conditions were used as for the other type. Results indicate no improvement over regular high speed tools. Superior red hardness of the cobalt type may show up better with very heavy feeds or in drills and other

Comm. Ti
Carbide; 150 sfm
0.012-inch/rev
depth—1/16-inch



Alloy Ti
HSS; 150 sfm
0.032-inch/rev
depth—1/16-inch



Alloy Ti
Carbide; 300 sfm
0.012-inch/rev
depth—1/16-inch

tools where it is difficult to dissipate heat.

Chrome Plating

There are a number of ways in which chrome plating might give better results in machining titanium. The titanium might have less tendency to weld to it. Hard chrome is known for its outstanding resistance to abrasion. Finally, if the coefficient of friction were reduced machinability could be improved.

The 18-4-1 tools were plated and run under the same conditions as in the other cases. Plating proved ineffective. It was noticed when measuring abrasion in the microscope, that the titanium welded to the chrome about as it did with the high speed steel.

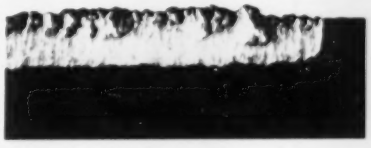
Welding Action

During our tool life tests we were surprised at the small amount and size of the built up edge. This was unusual in view of the low speeds and the known welding or galling characteristics of titanium.

However, titanium welded to the flank of the tool. There is no doubt that the mass of metal is a weld, for it can only be removed by grinding. It gives the brilliant spark characteristic of titanium.

These masses of metal can be felt by running the finger along the cutting edge. We don't think masses of the size shown at right exist in this position during cutting. However, this indicates that smaller welds do occur at this point and contribute to the abrasion during cutting. The small welds that may be formed and broken off from the flank during cutting could be a more important factor in the abrasion than the hard particles in the titanium.

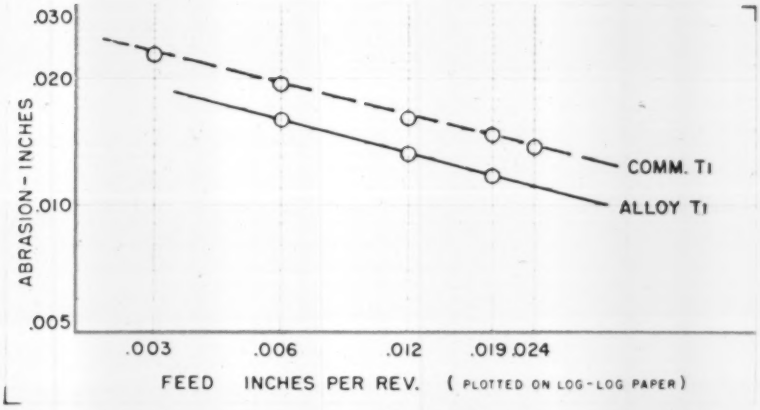
With the ductile type chip, hard carbides and similar particles would be expected to cause cratering rather than flank abrasion. An example of this type is found when high speed tooling is used to machine alloy tool steels in the annealed condition. The tool steels have a structure containing hard, abrasive carbides, yet their abrasive action results in cratering on top of the tool rather than flank abrasion.



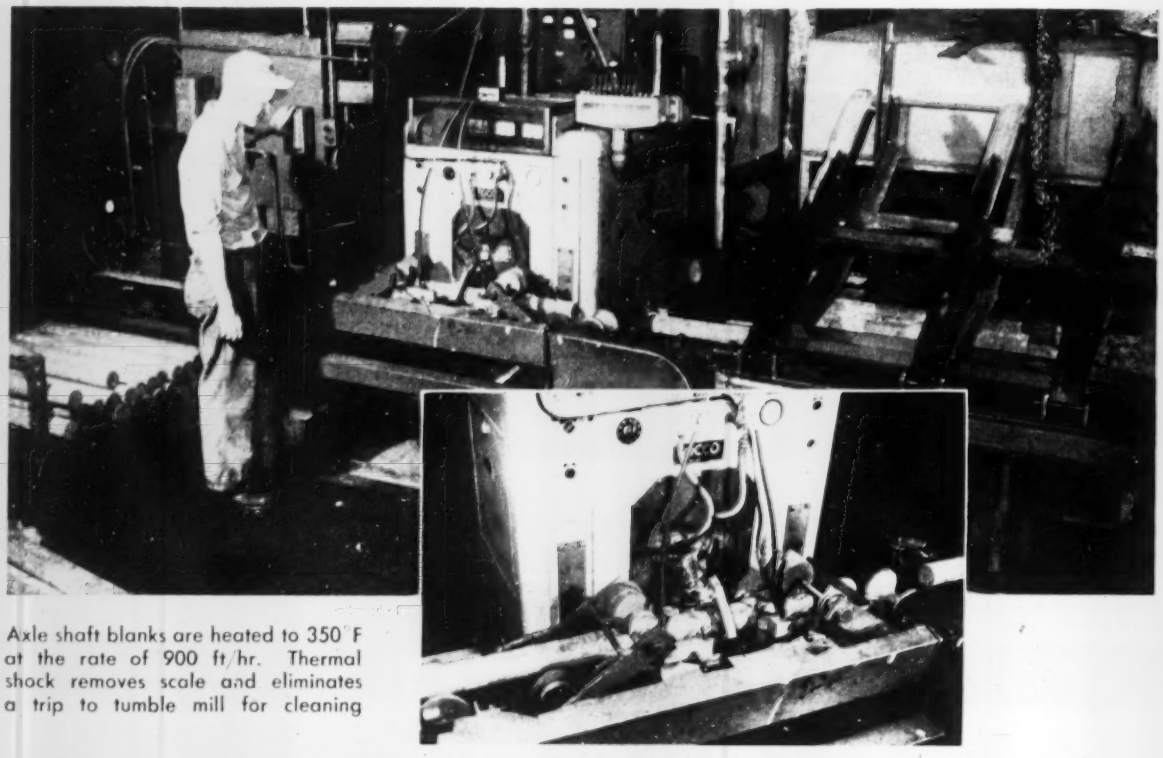
Relatively large masses of welded titanium seem to form at the moment of separation of the tool from the work. This can be prevented by allowing the tool to dwell for a moment without feed, before withdrawing at the end of a cut. Similar masses of titanium weld to the carbide tools under certain conditions. This is particularly true with higher speeds (300 sfm) and with negative rake angles.

Results of this study point up several important factors in the machining of titanium.

First item is that of machine and tool rigidity. Vibration and chatter must be kept at a minimum. Second is the importance of using proper feeds and speeds.



Effect of feed on tool abrasion. This demonstrates the desirability of heavy feed. Speed and inches cut were held constant throughout the tests



Axle shaft blanks are heated to 350 F at the rate of 900 ft/hr. Thermal shock removes scale and eliminates a trip to tumble mill for cleaning

Induction Heating

CUTS COSTS ON MANY FRONTS

Manufacturers are taking advantage of modern induction heating techniques to improve quality, increase production and lower costs in many types of operations

CASE STUDIES of many uses of induction heating in metalworking plants have one thing in common: They all show mass production economy.

And most of these applications are not in the field of surface hardening, where induction heating got its start.

Scale Removal—Here's just one example of this kind of cost saving: At International Harvester, axle shaft blanks are progressively heated to 350 F at the rate of 900 feet per hour using induction. The thermal shock removes the scale cleanly and completely. Formerly, parts were taken to tumble mills for cleaning. This application of induction heating saves Harvester over $7000 a year in labor costs alone.

Take a look at some facts recently cited by Dr. H. B. Osborn Jr., technical director, Tocco Division of Ohio Crankshaft Co., Cleveland. In 1936, 100 per cent of the company's induction heating applications were in surface hardening. In 1952, this use accounted for only about 8 per cent of total business. (However, the 8 per cent in 1952 represented considerably greater volume dollar-wise than the 100 per cent in 1936.)

Aside from surface hardening, induction heating is used on a production line basis for brazing, soldering, annealing, shrinkfitting, melting and heating for forming or forging. Continuous welding is being applied to pipe up to 20 inches in diameter. High frequency welding of aluminum tubing is a production line operation.

Automatic Forging — Bars are heated continuously by induction and then fed into forming machine. At Northwest Bolt & Nut Co., Seattle, a 50 kilowatt 10,000 cycle unit is used for heating bar ends for upsetting. When this unit replaced an oil fired slot type forging furnace, production was increased from 500 to 1500 pieces per hour on the ⅞-inch stock shown in the photo. Other advantages: Uniform heating, and longer die life due to reduction of scale.

Brazing Looking Up — In many instances, parts previously made by adding many hours of machining to solid or semi-formed stock are now produced by induction brazing together simpler parts at an overall lower cost.

The attachment of carbide tips to tools is now almost completely standardized as an induction operation.

Rapid heating characteristic of induction permits brazing opera-

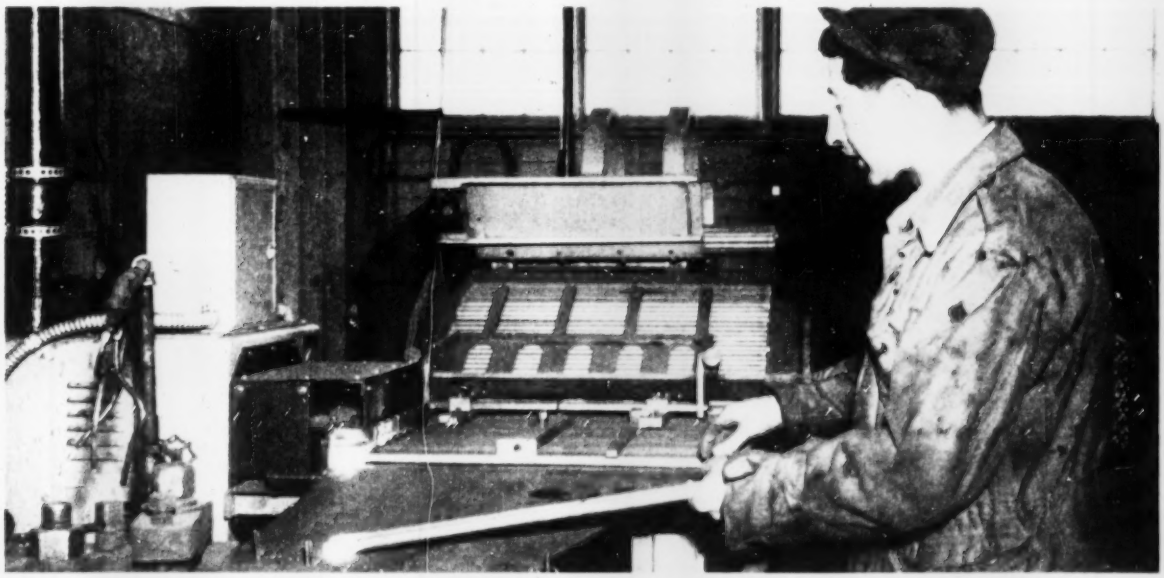
This 50 kilowatt General Electric electronic induction heating unit is used to harden the ways of lathe beds. Inductor coil travels across surface to be heated

tions on parts previously heat treated. Example: Burster tubes, nose adapters on ordnance shells are silver brazed by induction. The necessary physical strength of the shell, including its fragmentary requirements are not disturbed by this operation.

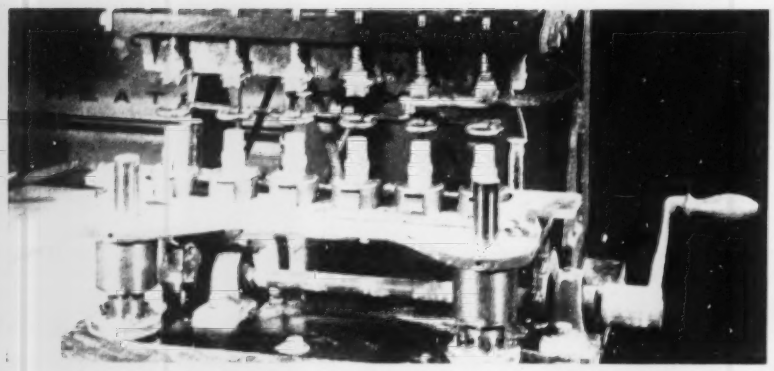
Induction heating is used to braze five sleeve parts of a lock produced by American Hardware Corp. The sleeves are fitted with a brazing ring, dipped into flux and then set in the cases on a six-place jig which accurately positions the parts. Next, the loaded jigs are placed on a fixture on an induction heating unit. A turn of the crank elevates them to brazing position inside an induction coil.

New Assembly—Hunter Spring Co., Carbondale, Pa., brazes heater blade assemblies for a portable mixer. A 20 kilowatt induction heater reduced production costs by $2.25 per hour and virtually eliminated rejects.

In this case a riveted assembly was replaced with a brazed design. Six blade assemblies are brazed at one time in a jig. It takes a total of 23¼ seconds for two brazing operations on each of the six



A 50 kilowatt, 10,000 cycle induction unit at the Northwest Bolt & Nut Co. heats bar ends for upsetting. Unit handles 1500 pieces of ⅞-inch stock per hour



Brass sleeve is induction brazed to steel case. Time required: 31 seconds

blades, which gives a production of 225 blades per hour.

Heat Treating Too—A cartridge case is made by deep drawing in successive operations to final shape from a slug or disk of suitable size. Cold working resulting from this processing produces adequate physical properties with brass. Steel, however, falls short of requirements, and it has been necessary to heat treat to make up the deficiency. The inherent characteristics of induction heating which permits the accurate, selective and automatic treatment of parts is put to work to increase the strength of the cartridge cases in those areas where it is necessary.

Really Fast — Thompson Products Inc., Cleveland, can harden over 3000 automotive valve tips a day using a 20 kilowatt electronic induction heater and a drum type handling fixture. The setup is right in the production line. As compared to the torch method previously used more consistent hardness depths have been obtained. Hardening costs have been reduced 30 per cent.

Rocker arms in Ford's engine must have properly hardened tappet surfaces. A 20 kilowatt electronic induction heater and automatic handling fixture do this job. It has been in operation over one year on a two shift, five week basis hardening the tappet surface on 22 rocker arms per minute to 58 Rockwell C.

For Machine Tools—Manufacturers of machine tools are using induction heating to harden the ways of lathe beds. Warner & Swasey Co., Cleveland, uses a 50 kilowatt electronic induction heater. Several different sized lathe beds are hardened with the same equipment.

A specially designed carriage conveys the inductor coil across the surface to be heated. A spray quench follows behind the heating coil so the metal is back close to room temperature when it is 2 inches beyond the coil. Cost of electricity used in a normal day's operation is only 10 per cent of the cost of the type of heat previously used.

Melting — Induction melting is widely used in the precision castings industry. It is a good method for melting and adding alloying elements. The induction method shows up best with the smaller furnaces—say up to 1000 pounds.

Three 1000-pound induction melting furnaces are being installed by General Motors to melt jet engine alloys which are poured into the form of shot. A battery of 72 eighteen-pound induction melting furnaces is used to remelt the shot for casting the precision jet engine parts.

Looking Ahead—New techniques to cut corners on costs will undoubtedly expand use of induction heating—that's what the experts working in the field are predicting.

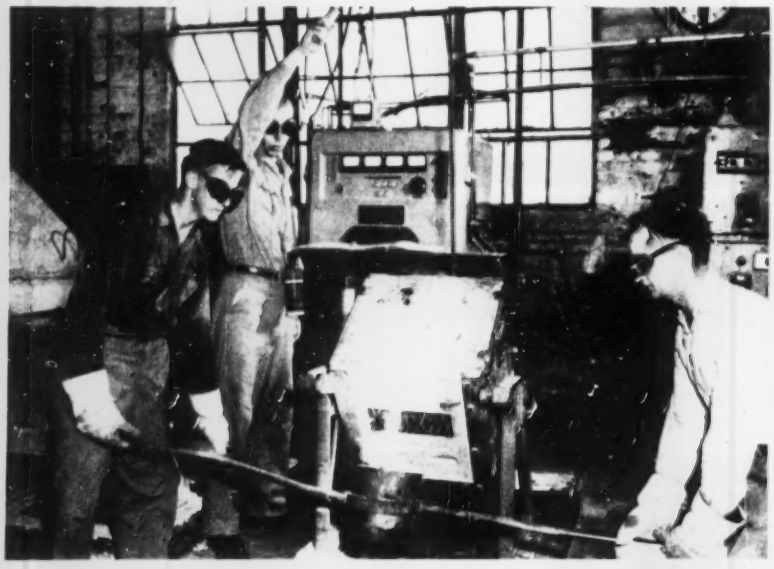
In some cases, 60 cycle heating will be used up to certain temperature ranges, and then a transfer made to higher frequency.

Present dollar per kilowatt cost is too high for induction heating of strip for rolling, but this can change.

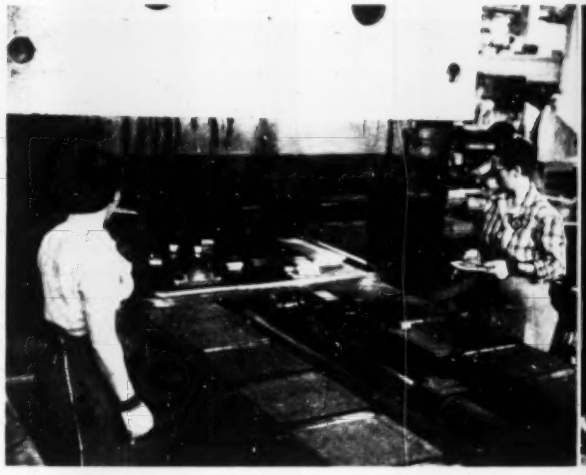
Induction heating may smooth out continuous casting difficulties by supplying controlled heat in the tundish funnel stage before metal goes into the casting machine.

Hot machining may work its way to the front for some uses as experts continue to study the application of induction methods to heat parts while they are machined.

Ohio Crankshaft's Tocco Division is deep in experimental work to develop their patented induction method for hardening the bore of conventional soft cylinders. This could mean greatly increased engine life in automotive applications, trucks, busses and marine uses.



Closer temperature control, cleaner melts, cooler and less congested conditions account for increasing use of induction melting in assembly line work



Overpressed parts sandwiched between female dies and form blocks are shown emerging from the hydraulic press

Overpressing dies and parts manufactured. Worker holds die and the form block used is located directly below

Small Lot Stampings PRODUCED ECONOMICALLY

Low cost female dies make possible the forming of sheet metal parts without subsequent dewrinkling. Process pays for itself on runs involving as few as 10 parts

By THOMAS A. DICKINSON

MODIFICATION of the Guerin process, known as overpressing, currently permits the production of improved stampings in small quantities with exceptional economy at Consolidated Vultee Aircraft Corp., San Diego, Calif.

It involves the use of rubber pressure pads, form blocks, and relatively low hydraulic pressures (about 900 to 5000 psi) in conjunction with tools that can be most accurately described as inexpensive female dies—each of which is mated with a form block. The female dies make it possible to form sheet metal parts without the wrinkles and other defects that are normally encountered in utilizing the Guerin process, due to the unequal distribution of compressive forces.

In addition to saving much of the time and equipment that is normally required to straighten or dewrinkle Guerin-processed parts, this eliminates the possibility that sheet metal parts will be excessively work-hardened or damaged before they are assembled.

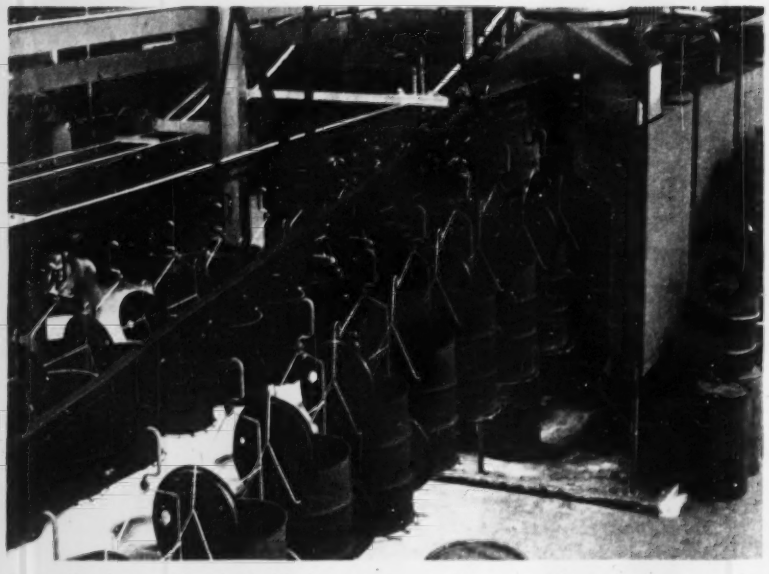
Nothing Extra — Convair isn't the only company to develop improved methods of press forming wrinkle-free parts in small quantities during recent months. However, the subject processing technique does appear to have two very distinct advantages: 1. It permits the use of hydraulic press facilities of the types that are already available in factories manufacturing sheet metal products. 2. It does not appreciably increase the cost of forming tools, since the female dies cost about $4 each.

The female dies which distinguish this procedure from similar innovations in the sheet metal field are sheet-steel tools of heavier gage than the stock materials to be fabricated. They are formed simply by placing steel sheets over form blocks and using the Guerin process in a conventional manner — that is, by using a rubber blanket to apply pressure to the sheets.

Ready To Go—Preparing the female dies for production requires: Manually or mechanically dewrinkling the formed steel materials in a conventional manner. Trimming the dewrinkled tooling components. Tack welding steel strips to those areas of the tools that might be damaged during subsequent press operations (due to severe contours, sharp radii, etc.), if they weren't properly reinforced. Drilling holes in the tools to match locating pins which are next mounted on mating form blocks.

Holes to match locating-pin positions are also drilled in stock materials, so that neither the stock nor the female dies will be misaligned with the form blocks during press operations. Heavy grease lubricants on stock materials minimize die friction and resultant workhardening or scratching.

By saving the cost of dewrinkling sheet metal parts, Convair's new female dies can usually amortize their initial costs in the process of manufacturing less than 10 identical parts. Where as many as 20 duplicate parts were required, the female dies have respectively reduced the overall cost of Guerin-processed parts by margins exceeding 50 per cent a very impressive fact because the less expensive parts were, as previously indicated, of superior quality.



Specially designed racks hold drum parts as they move through cleaning, descaling and phosphatizing machine. After this comes painting and assembly

DRUMS COME CLEAN AND RUST-INHIBITED

Processing line turns out chemically clean and protectively coated drums that will hold their finish longer. Complete absence of mill scale ends contamination troubles

STEEL DRUMS pass the "white handkerchief test" now that chemical treatment removes grease, dirt and scale; and in the same operation, gives inside and outside surfaces a coat of rust-inhibiting zinc phosphate. The process was pioneered at U.S. Steel Product's Port Arthur, Tex., plant.

These treated drums, they report, are cleaner than their predecessors which were hand-wiped with solvents, invariably leaving a residue of dirt and scale on the interior. Process involves fabricating the drum shell, head and bottom then treating these unassembled component parts.

Big Cleaner—Cleaning and phosphating takes place in one of the largest power spray washers in the world. Sequence through the cleaning portion of the machine involves six steps: Alkali-cleaning (grease removal), rinsing, sulphuric-acid pickling (scale removal), first rinsing, second rinsing, and one final rinse before the phosphate coating.

Strength of alkali used is dependent on the kind of drawing lubricant to be removed from the stamped heads, and the pickling acid is inhibited with Rodine, a product of American Chemical Paint Co. All rinses take place in unheated water, overflowing to prevent carryover of material from one step to the next in the line.

Coating Operations—Zinc phosphate coating with Granodine, also a product of American Chemical Paint, is applied by bringing a balanced zinc phosphate solution into contact with clean, scale-free steel. For the treatment of large numbers of similar products such as these, continuous spray phosphatizing machines are universally used. Work passes through the various stages on a conveyor that carries it under the spray nozzles. Run off is collected in a tank and resprayed.

After the coating, excess chemicals are removed and the parts are rinsed in a very dilute solution of chromic-phosphoric acid. This is very important if highest corrosion resistance and resistance to blistering of the organic finish is to be obtained from the coating.

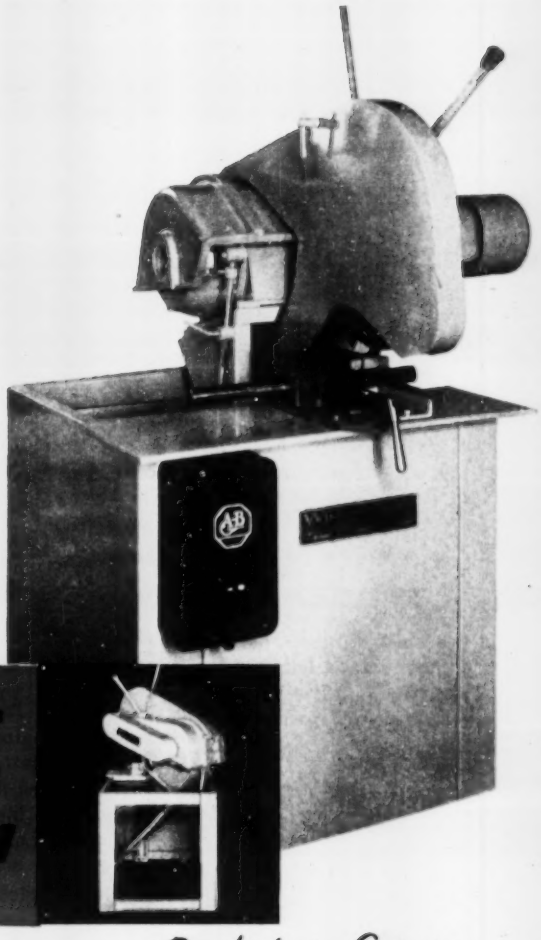
Scale Removal Important—Durability of both the phosphate coat and the final exterior paint finish hinge largely on the completeness of the scale removal. Although apparently tenacious, rough handling in even normal drum usage can dislodge the scale, taking the interior or exterior coatings with it. This causes contamination of the drummed product or leaves the exterior surface open to rusting.

With scale completely removed, as it is in this process, a greatly improved holding surface for coatings and finishes is presented. The bond formed between coated steel surface and the paint gives a finish particularly adaptable to poster-type advertising that is recommended for use on the outside of the drums.

Meets Standards — Zinc phosphate finishes on scale-free steel not only meet the specification requirements of grade I, JAN-C-490, but have been standard practice for many years in the automotive and appliance industries as economical pretreatments for finish durability and under-finish rust resistance.

U.S. Steel Products has determined that a coating of 150-200 milligrams per square foot is optimum amount. Below this the danger of rusting is greatly increased, while coatings much above this range tend to break off under reverse impact conditions.

Cut up to 6" pipe *and 8" channels* in 6 seconds



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Read these features

POWER—Available with either 7½ or 10 h.p. heavy-duty motors.
ABRASIVE WHEELS—Uses either 18" or 20".
CUT DIAMETER—Up to 6" pipe and 8" channel.
MITRE—Cutting head rotates for cuts from 90° to 45°. All positions are calibrated.
DRIVE — 5 specially matched B-type V belts. (2300 r.p.m. spindle.)
GUARD—Assures complete operator safety. Also acts as spark catch.
NO. 2 MAGNETIC STARTER—Standard equipment on all Wise saws.
CUTTING HEAD STROKE—Heavy-duty counterbalancing spring absorbs 90% of weight. Reduces operator fatigue to a new low.
CONSTRUCTION—Cast, heat treated aluminum cutting head. Fabricated steel wheel guard and table. Oversized, sealed ball bearings on spindle.

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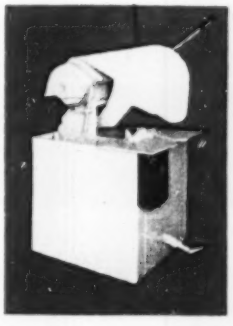
This saw is especially popular for low cost right angle cutting of structurals, pipe, wire rope and similar work. Uses either 7½ or 10 h.p. heavy-duty motors and 18" or 20" abrasive wheels.



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Don't Write Off the Blast Furnace

Recommended alterations in the design of present-day blast furnaces for the purpose of employing oxygen-enriched blast warrants study of operating principles, theories and specifications

Part II

By CHARLES E. AGNEW
Consultant
Blast Furnace and Sintering Plant Operations
Cleveland

SINCE the blast furnace industry of the United States has led the world in furnace practice for many years the design of furnace with which that eminent position was attained may be used to illustrate the relation of preparation to smelting capacities. For close to 100 years the great majority of United States furnaces has used Lake ores; consequently, the development in furnace design has been influenced by practice phenomenon observed and encountered with Lake ore practice.

A modern furnace will have a shaft approximately 2½ times the height of the bosh. With the use of Lake ores, or ores from other deposits having similar characteristics, this relationship affords opportunity for thermal economy through efficient recovery of heat necessary to effect the shaft reactions with minimum production of flue dust and loss of heat to top gas. However, in recent years at many furnaces excessive production of flue dust and loss of heat with top gas has been accepted with the use of fast blowing rates in order to increase stock travel because of urgent need for iron production. Also, it is at least open to question whether or not the relation between stockline and hearth diameters in latest furnace design has not passed a critical ratio which adversely affects thermal economy of the operation. But basically the high shaft furnace has proved its worth.

Capacity Is Deficient — With furnaces having the ratios between bosh and shaft heights as previously mentioned, the thermal balance calculation indicates that operations with Lake ore, or other similar volatile bearing ores are generally deficient in raw material preparation capacity in relation to smelting capacity. Similar calculations for furnaces of like proportions and design but using fully beneficiated raw materials (sintered iron ore concentrates and other volatile free materials) are deficient in smelting capacity in relation to raw material preparation capacity. With either capacity relationship, a change in furnace design is not justified. Rather, in the interests of operating economy, raw materials should be beneficiated, or operating technique altered, in order to increase capacity of the division which is deficient so it will equal division having greater productive capacity.

It should be obvious that for any furnace of given working volume (cubical displacement between stockline and centerline of tuyeres) there will be an optimum blowing rate, suitable to the character of raw materials used, beyond which it is economically impractical to make sacrifice in flue dust production and loss of sensible heat with top gas leaving the furnace, in order to increase production. Where such practice is used the difference between a theoretical ideal natural air blowing rate and an excess rate, which is within a permissible economic range of sacrifice, will not exceed 5 to 10 per cent, and probably it is closer to 5 than to 10 per cent.

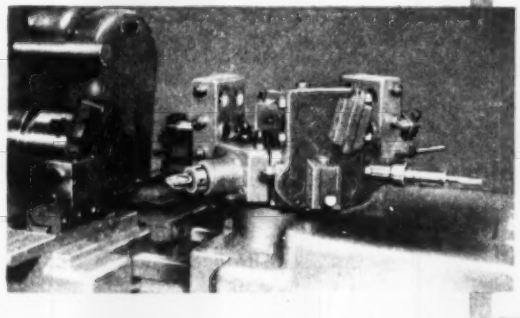
Stock Travel Rate Increases—Occasionally a furnace using its normal maximum natural air blowing rate will start to travel too fast. If the stock travel rate is not checked the furnace will go cold—indicating, for any furnace, there is a ratio between rates of maximum stock travel and heat absorption by stock beyond which the necessary thermal reactions cannot function in their proper sequence. In short, with conditions described the furnace is overloaded in both the raw material preparation and the smelting stages beyond a critical point where reduction in burden will not correct the fault; only a check in the stock travel rate will suffice.

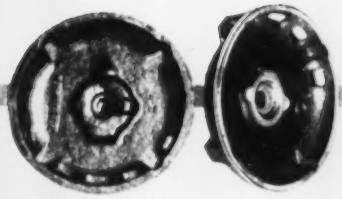
The evidence presented is offered as justification for the statement that gain in production through increasing stock travel beyond a maximum ideal rate is not only definitely limited to a comparatively small percentage of increase but even that can be had only with sacrifice in operating and thermal economy.

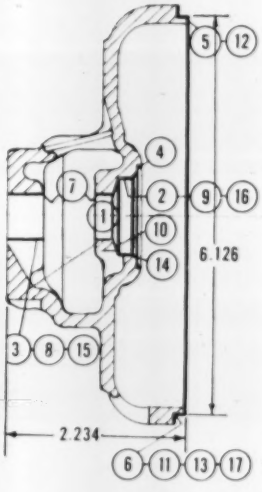
Principles of blast furnaces operation, which have been presented in the foregoing resume, have been proved by qualified research authorities, and have been confirmed

NOT CLAIMS...
BUT
ACTUAL FACTS!

17 Operations in 1.85 Minutes







FIRST TURRET FACE
1 Spot Drill Hole
2 Rough bore 1.125" counterbore

SECOND TURRET FACE
3 Core drill hole through
4 Machine two pads at front of hole
5 Rough face end at rim
6 Rough face and form turn 6.126" diameter

THIRD TURRET FACE
7 Break corners at core in center of hole (Slide Tool)

FOURTH TURRET FACE
8 Finish bore hole
9 Finish bore 1.125" diameter
10 Counterbore and form bevel at bottom
11 Finish turn 6.126" diameter
12 Finish face end
13 Finish face shoulder
14 Chamfer

FIFTH TURRET FACE
15 Ream hole .6245" diameter

SIXTH TURRET FACE
16 Ream counterbore 1.125" diameter
17 Size turn 6.126" diameter

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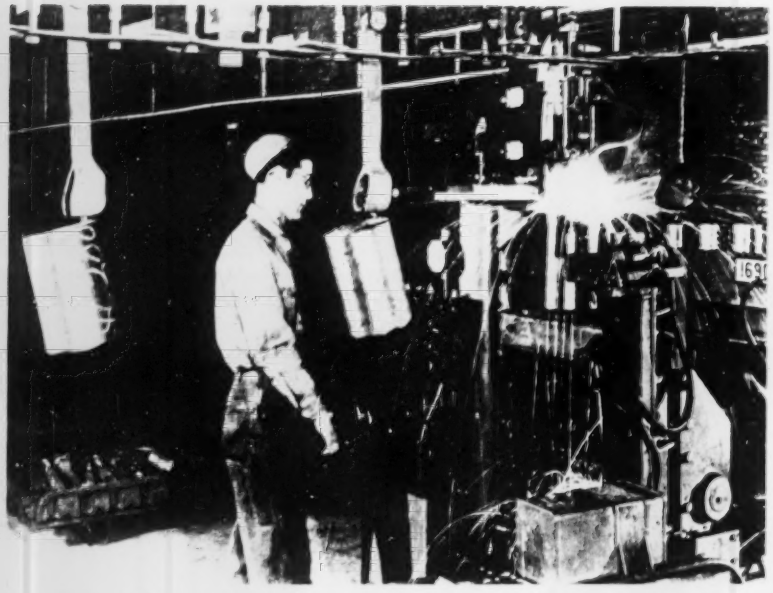

Hanging Slugs Swing Through Heating Cycle

Hanger studs carry stainless steel slugs through the furnace heating cycle and salt bath enroute to the extrusion press at National Tube Division's new hot extrusion mill in Gary, Ind. Slugs are installed above by a standard gun built and incorporated into the production line by Nelson Stud Welding Division, Gregory Corp., Lorain, O. Mild steel studs have $^{3}/_{4}$ to $^{7}/_{8}$-inch diameters

with practical demonstration in many furnace operations. The operating phenomenons cited are matters for common observation at any furnace plant. Therefore, before unqualified acceptance can be given to a recommended change in furnace design in order to use oxygen-enriched blast, consideration must be given to the theories upon which the recommendations are based in order to judge whether or not they conform to proved operating principles. Some consideration of the kind may be given with an analysis of such theories which have been orally discussed, and those which have been publicized in patent specifications.

Analysis of Patent Specifications—When the use of oxygen-enriched air for the blast furnace was first conceived is not known but patent office records prove it was long before commercial oxygen was available in sufficient quantity, or at a cost, which justified full scale furnace tests. Since opportunity for such tests is now available theories advanced in patents having recent dates of issue are most pertinent to this series of articles.

United States patent No. 2,605,180 was issued July 29, 1952, to Friedrich Totzek, Essen-Ruhr, Germany. Application for this patent was filed in the United States, Jan. 15, 1919, and in Switzerland, Dec. 7, 1918. The patent is of particular interest because the claims are based on an assumed need for change in blast furnace design if an appreciable percentage of oxygen is added to the blast. Also, the use of auxiliary gases at the tuyeres is advocated as a means for increasing iron oxide reducing capacity, and to give wider dissemination of temperature at the tuyere zone.

Whether or not the blast furnace operating conception described in the Totzek patent specifications, and the operating phenomenon used for illustration, in any way influenced preparation of the United Nations technical report is not known, but because of similarity of belief the variance of Totzek's specifications and claims from proved blast furnace operating principles is offered in substantiation of the statement made regarding the United Nations technical report recommendation for change in furnace design being impractical in the technical phase of furnace operation.

Discusses Oxygen Tests—As a preface to the presentation of claims, and offered as a basis for them, Totzek describes actual furnace tests where oxygen was used in various percentages of enrichment. His deductions from the tests, and his conception of means for correcting the undesirable phenomenon encountered, are so contrary to proved blast furnace operating principles and normal operating phenomenon that it is believed they fully substantiate the statement made. A few extracts from the patent specifications are quoted here in support of this belief:

"It has already been tried to produce iron in a blast furnace with the use of a blast containing more oxygen than is contained in air. The earlier tests have been made with a blast furnace of such a design as is generally used when air is being applied as blast, and it has been ascertained that a moderate increase of the content of oxygen, say up to 30 per cent of oxygen, may have the effect of decreasing the temperature of the blast furnace gas at the outlet of the blast furnace as compared with the temperature which will result while using air blast. Simultaneously, there was found a light decrease in consumption of solid fuel. The tests showed, however, that a further increase of the oxygen content in the blast led regularly to serious disturbance in the operation of the furnace which became the more serious the more the oxygen content was increased and which finally put the furnace completely out of operation because it was no longer possible to melt the slag and the iron in the bosh of the blast furnace in order to tap them from the furnace."

The specifications state, when contemplating the use of oxygen in the blast that it was believed there would not be material change in the hearth reaction other than a probable increase in hearth temperature. However, it was assumed there would be considerable change in the operating conditions and reactions in the stack above the bosh, thus:

". . . on account of the decrease of the quantity of the hot gases rising from the hearth due to the decreased quantity of nitrogen in the oxygen-enriched blast."

With the conception of the cause of the difficulties, disclosed in the patent specifications, various

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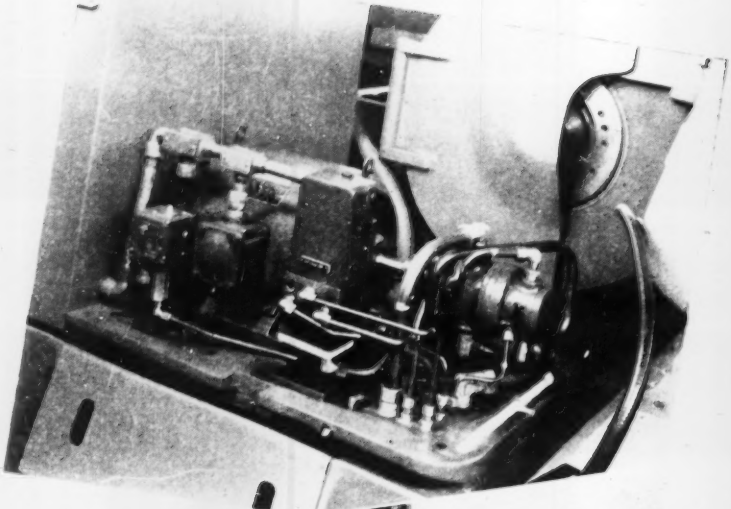
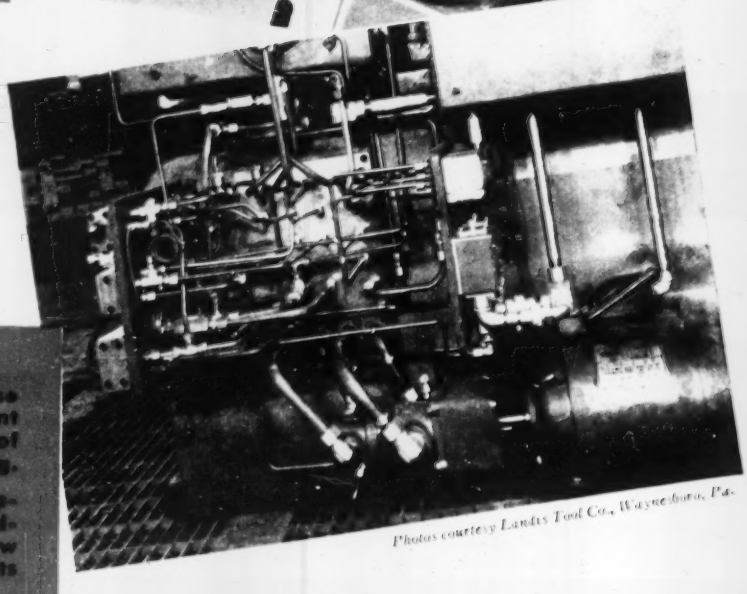
SUMMERILL HYDRAULIC TUBING





Photos courtesy Landis Tool Co., Waynesboro, Pa.

- ★ **Summerill Tubing is made in the nation's most recently built plant for the exclusive production of cold drawn seamless steel tubing.**
- ★ **The latest methods and equipment are used. Always a standard for quality, Summerill is now shipping the finest tubing in its history.**
- ★ **Only selected raw material—the very best—is used to make Summerill Hydraulic Tubing. It is a true premium product, made in accordance with JIC Standards for tubing in industrial equipment.**
- ★ **Every length is closely inspected and rigorously tested before shipment to assure uniform physical characteristics and hydrostatic qualities; ends are flared to be sure of ductility, etc.**

Illustrated above are typical examples of the use of Summerill cold drawn seamless steel tubing in the hydraulic pump hook-up and control lines of modern machine tools.

In this field, as in many others where liquids must be conducted under high pressures reliably, the trend today is toward the use of steel hydraulic tubing exclusively. It is safer, stronger won't break at stress points, bends, etc., yet handles and works easily and is simple to fabricate.

Summerill's new plant and progressive methods bring you hydraulic tubing at its best, in a full range of carbon steel sizes from $\frac{3}{16}$" to $1\frac{1}{2}$" O.D. ● Let us quote on your requirements. ***Summerill Tubing Company Division, Columbia Steel & Shafting Company, Pittsburgh 30, Pa.***

WSD 4271

IN COLD DRAWN SEAMLESS STEEL TUBING

SPECIFY *Summerill* **AND BE** ***SURE!***

means suggested for correction were:

"The difficulties arising in the operation of a blast furnace with a blast of a comparatively high content of oxygen (more than 30 per cent O_2) are known to those skilled in the art. The serious difficulty is the tendency of the furnace to hanging or bridging. In order to eliminate these difficulties it has been proposed (1) to decrease the angle of the bosh and (2) to decrease the height of the stack above the bosh.

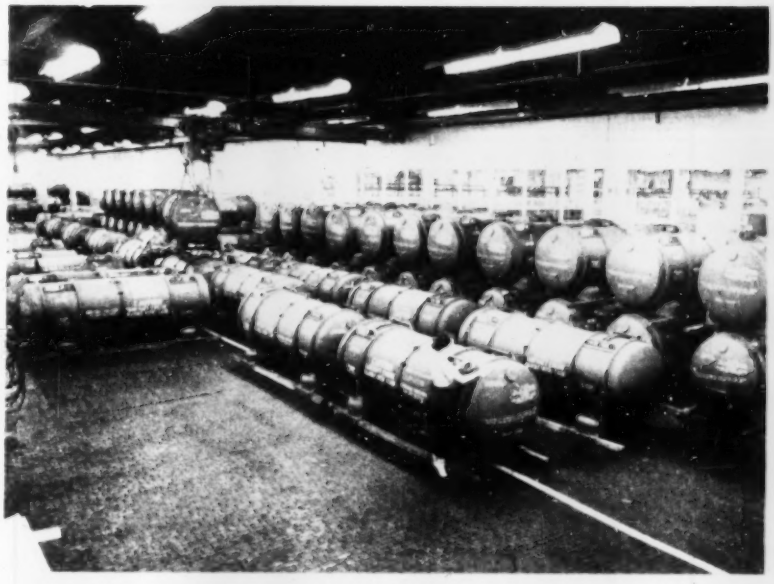
"On the basis of these considerations it has been proposed to introduce carbon monoxide or blast furnace gas into the hearth of the blast furnace through special nozzles or tuyeres arranged in the spaces between the usual nozzles introducing the blast. It has also been proposed to introduce blast furnace gas into the stack above the bosh."

Effect of Auxiliary Gases—Belief was expressed that the introduction of auxiliary gases into the furnace would increase indirect reduction of iron oxide in the shaft and so reduce the amount of direct reduction otherwise required in the hearth. It was assumed by so doing that the temperature of the hearth would be sufficiently increased to permit tapping the iron and slag from the furnace in the molten state. It was assumed the cooling of the hearth to the point where slag and iron could not be tapped from the furnace was due to:

". . . inferior preparation and the diminishing indirect reduction in the stack above the bosh and of the overloading of the hearth with the so-called reduction effected thereby. But all of these considerations and proposals have proved to be unsuccessful."

The theories regarding the use of auxiliary gases are of interest because to some extent similar ones have been advanced in the United States. In the light of United States Bureau of Mines' research measurements of blast furnace reactions, their isolation of zones in the furnace where the respective reactions occur, and the opportunity which exists in the present era for comparison of the practice phenomenon encountered with like phenomenon of normal furnace operations, the comment in the last sentence of the last quotation is significant of the fallaciousness of the theories advanced.

In the deductions drawn, the importance of the easily effected iron oxide reduction reaction was overstressed while ill effects from other reactions, more difficult to effect, were disregarded.



Jet Engines Canned for Shipment

Completed jet engines at Westinghouse Electric Corp.'s Kansas City, Mo., plant are canned for shipment in these special skid-mounted containers. To simplify insertion or removal of engines, containers part at the center. Before shipment, most of the air is evacuated, then 5 pounds of dry air pumped back in

Cites Basic Errors—Study of the Totzek patent specifications and practice phenomenon cited indicates the dominant thoughts governing the applicant's conception of furnace thermochemical reactions, and belief in the need for a change in furnace design, are based on three basic errors.

1. *Considering the reduction of metallic iron from the oxide formation as an endothermic reaction.* Joseph and Neustaetter in a calculation based upon principles of thermodynamics show the reduction of iron in a blast furnace, in its full cycle, is an exothermic reaction.[1]

2. *Apparent belief that fusion does not occur until stock descends to the tuyere zone.* The United States Bureau of Mines research proved with quantitative measurements that initial fusion starts at the top of the bosh.[2] Undoubtedly elevation in the furnace of the plane of initial fusion is a variable but as proved by the research, as well as conditions commonly observed in furnace operation, initial fusion occurs well above the tuyere zone.

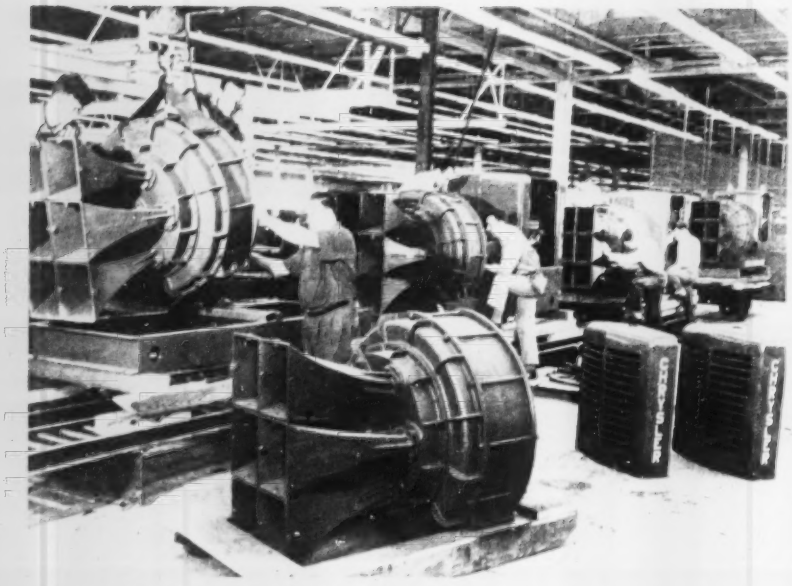
3. *Disregard of distinction between heat volume (Btu) and temperature (Btu concentration) requirements necessary to effect furnace reactions.* The research referred to in item 2 proved combustion of coke carbon was completed in two stages in a zone adjacent to the tuyeres, first with combustion of C, which then reverts to CO: ($C + O_2 \rightarrow CO_2$, 14,580 Btu/lb C which reverts to $CO_2 + C \rightarrow 2CO$, 1370 Btu/lb C). With this proof it should be obvious that temperature at the tuyeres, where the exothermic CO_2 reaction occurs, will be higher than it will be after the reversion of CO_2 to CO, an endothermic reaction, because temperature is the measurement of heat volume (Btu) concentration. Also, it should be obvious that temperature at the tuyeres must be higher than in the CO_2-CO reversion zone because otherwise there would not be sufficient heat volume remaining after the endothermic reversion reaction to perform the reactions necessary for furnace operation. Fusion of stock solids and completion of other reactions are consummated by providing the required heat volumes (Btu) at the respective required temperatures. Specific illustration follows:

Temperature observation:[2]

At tuyeres, C	1534

[1] "Use of Carbon in the Blast Furnace and Heat Balances," by T. L. Joseph and Kurt Neustaetter. *Blast Furnace and Steel Plant*, July 1947.

[2] Technical Papers Nos. 391 and 397, U. S. Bureau of Mines, Washington.



Civil Defense: Assembly-Line Basis

Special siren assembly line at Chrysler Corp.'s Trenton, Mich., plant is used to put together some of the largest air raid sirens ever devised for civilian defense. The sirens develop 138 decibels of sound 100 feet from the throat, can be heard under normal conditions anywhere within an area 8 miles in diameter. Each warning installation gets its power from a 180-hp Chrysler engine

Of iron tapped from furnace	1385
Of slag tapped from furnace	1409
Heat carried from furnace:[2]	
Per lb slag, Btu	840
Per lb iron, Btu	485
Heat consumed for reduction 1 lb silicon[3]	9171

Silicon is reduced by carbon in the electric furnace at 1460 C in the presence of iron; ferrosilicon is formed at about 1200 C[2]. Therefore, in a blast furnace, it is reasonable to believe silicon reduced and alloyed with iron cast from the furnace will reduce somewhere between the two temperatures cited. As illustrated, there is no great difference in temperature requirements for the respective needs cited but heat volume requirements (Btu) for the reduction of 1 pound of silicon is 18 times greater than the need for a pound of iron.

From this evidence it should be obvious that temperature, although a vital factor in blast furnace operation, is not the lone factor because unless accompanied with the heat volume (Btu) required for the respective reactions it has no value.

Carbon Combustion at Tuyeres— By weight, natural air contains 23 per cent oxygen and 77 per cent nitrogen (disregarding the variable minor percentages of other constituents). Calculation based upon atomic weights indicates the substitution of 1 per cent oxygen (at. wt. 16) for 1 per cent nitrogen (at. wt. 14.01) plus the carbon (at. wt. 12) consumed in combustion will increase Btu generation from CO_2 formation, 4.07 per cent, and from CO formation, 4.34 per cent. Gas weight produced with CO_2 formation will increase 0.0032 per cent and with CO formation 0.0064 per cent. Although the increase in gas weight over natural air combustion is negligible the fact that it is negligible is believed to be an item of major importance governing successful use of oxygen-enriched air. This phase of the subject will be discussed later. However, these combustion data indicate Totzek's error in assuming there would be less gas rising from the bosh to the shaft after the substitution of oxygen for nitrogen.

Since the coke carbon combustion rate determines the stock travel rate through the furnace each 1 per cent substitution of oxygen for nitrogen in the blast will increase stock travel 4.34 per cent; therefore, the Totzek conception of using 30 per cent, or more, oxygen in the blast would increase stock travel a minimum of 7 × 4.34 = 30.38 per cent.

In the light of the effects upon thermal conditions from increasing stock travel only 5 to 10 per cent above a permissible maximum natural air blowing rate, which have been repeatedly, conclusively, and widely demonstrated in many furnace operations, the Totzek conception of using 30 per cent or more oxygen in the blast would cause a prohibitive percentage of increase in stock travel. It is assumed there was no reduction in blast weight after the introduction of oxygen since there is no reference to it in the patent specifications.

Capacities Become Overloaded— With an increase of 30.38 per cent in the stock travel rate both the preparation and smelting capacities of the furnace would be overloaded beyond any possibility of performing their proper functions and therefore the principle of ratio of capacities was not applicable. Opinion expressed in the patent specifications as cause of the overload in the hearth was insufficient indirect reduction of iron oxide in the shaft, thus causing reduction of temperature in the fusion zone to the point where slag and iron could not be melted:

"This zone of fusion is here understood to be the annular space in the hearth at the level of the tuyeres or nozzles where the solid carbon is most uniformly used by oxidizing substances with the formation of gaseous carbon monoxide so that the charge in the stack sinks evenly into the annular space just mentioned."

The reference in the specifications to the reduction in top gas temperature with the use of oxygen-enriched blast cites a condition which would logically be expected with the increased charging rate of cold stock due to increased stock travel. A like reduction in top gas temperature would occur with the use of natural air and an increased stock travel rate. Moreover, the freezing action in the bosh and hearth attributed to temperature conditions created from the use of 30 per cent or more oxygen in the blast would occur with natural air blast if the two divisions of the furnace operation were overloaded with burden to a like percentage of increase.

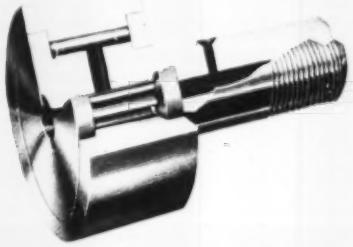
(To be continued)

CAM ACTION IMPROVED with MULTIROL® BEARINGS

under heavier loads • with shock resistance • and space economy

Modern demands for faster, more automatic machines necessitate a new approach to cam action efficiency. Improvised bolt and roller units are no longer adequate for this mass production machine age.

Machinery manufacturers are finding that even at slow speed, it is difficult to carry the usual heavy radial and intermittent shock loads of cam application efficiently on plain bearings or standard anti-friction ball and roller bearings. With increasing speeds, and lubrication limited by the desire for simplified design, the plain bearing wears excessively and fails early. Ordinary ball or radial roller bearings used on a shaft as cam followers have a



tendency to split in the outer race because of the excessive strain on the thin and superhard race sections.

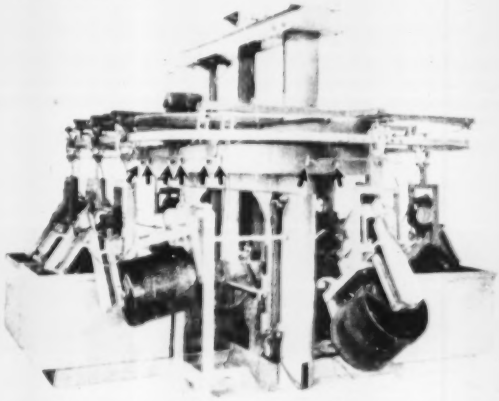
One bearing that has proven particularly successful in cam follower applications is the Multirol CF series full type roller bearing. This bearing is built especially for the repeated shock loads of typical cam action operations. The outer race section is not only heavy radially but is also martempered to combine maximum toughness with adequate surface hardness for withstanding the punishment of cam applications. The outer ring operates on a full complement of small diameter rollers so the load is evenly distributed over a greater bearing surface. The inner race and flange are made in a single piece with the stud, preventing any possibility of disassembly in operation. Greater accuracy is maintained throughout longer bearing life and, compared with plain bearings, both starting and rolling friction are reduced to a minimum. As a result internal wear is diminished and power requirements of Multirol bearing equipped machines are appreciably lessened.

Load Capacity Comparison

To illustrate the increased capacity of the Multirol CF, here is a comparison between a Multirol CF-1 bearing and a corresponding friction type roller, making use of the maximum permissable bearing pressures in pounds per square inch of projected area. The CF-1 bearing will have a maximum of 2240# while the equivalent friction type roller would have a capacity of less than 400#.

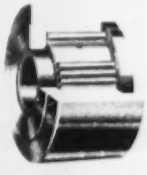
What This Means in Terms of Performance

The James Hunter Machine Co., of North Adams, Massachusetts replaced units consisting of a standard roller bearing and hardened roller with Multirol CF bearings on eccentric cams that actuate rake teeth in their wool washers. The changeover reduced their original and replacement costs over 10% and reduced maintenance to occasional lubrication. Where previously rollers only lasted a maximum of several months, no replacements have been required with the Multirol bearings. As a result, the Multirol Bearings solved a trouble spot that brought in many customer complaints.



Crown Rheostat and Supply Company of Chicago uses up to 200 Multirol Cam Followers as guide and support rollers in the travel and transfer mechanism of their cleaning, plating, and drying machines. Formerly trolleys were suspended from rails but the cam follower units proved to be a more precision means of friction reduction and added stability to the supporting arms.

Other McGILL® Bearings



MULTIROL CYR

MULTIROL SE

GUIDEROL CT

A new 140-page Bearing Reference Guide complete with 30 pages of vital engineering data has just been released by the McGill Manufacturing Company. It has the full story on the advantages of Multirol CF Bearings as well as information on the Multirol CYR, Multirol SE and Guiderol Bearings. Send now for your copy of McGill Catalog No. 52.

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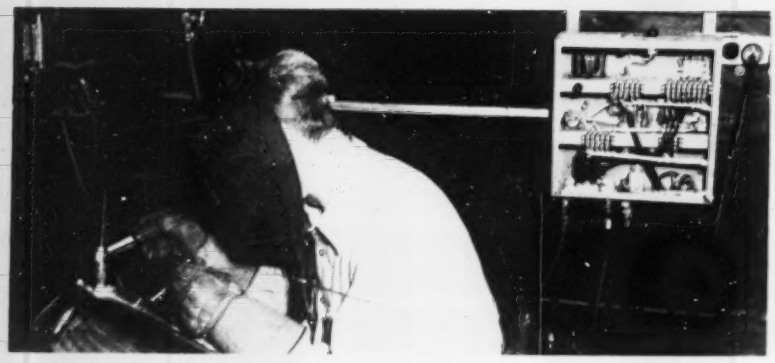


Typical of the 84 Heliarc welding stations is this one, showing the automatic argon and water control panel. Simplicity of device is easily seen

Simple Controller Cuts Welding Gas Bills

From standard electrical components, Ryan engineers devise automatic argon control for Heliarc welding. It takes the guesswork out of starts and stops, lowers operating costs

ARGON gas bills at Ryan Aeronautical Co., San Diego, Calif., were cut 20 per cent when they put an ingenious control accessory on their Heliarc welding units. Said to be completely automatic and foolproof, the device takes the guesswork out of the starting and stopping procedures and saves gas in the process.

In manual Heliarc welding, the operator is required to turn on the flow of argon gas and water before striking the arc. The argon provides a blanket of inert atmosphere which protects both the tungsten electrode and the weld area from oxidation at the high welding temperatures. Circulating water cools the torch and electrical cables.

Relies on Memory—Ordinarily, substantial amounts of gas are wasted in these starting and stopping procedures because the welder must depend upon his memory and judgment to control the time cycle. He has a tendency to allow an excessive flow in order to be sure to exceed the minimum interval of from 3 to 5 seconds. These excesses at 84 welding stations cost the company an estimated $3200 per month.

Since the argon gas control is incorporated in the torch hook, if the operator stops welding but does not hang up the torch, gas continues to flow. Frequently it is necessary to stop welding to shift the part, pass over holding jigs or clean the torch. Welders seldom hang up their torches during these operations.

Automatic Timing Cycle — Six development laboratory men at the company dreamed up the gas-saving device which consists of a few simple relays and condensers, all of which are standard electrical parts with the exception of one special relay constructed in the laboratory. It contains no tubes or motors and requires no adjustments either for varied work setups or because of wear.

The timing cycle is started by means of a microswitch located in the foot pedal voltage regulator used for Heliarc welding. As the operator depresses the pedal to obtain increased voltage for striking the arc, the microswitch is closed. This energizes two interdependent circuits, one of which immediately actuates two solenoid-operated valves to start the flows of gas and water. At the same time a condenser in the circuit is charged and begins to dissipate its current.

Cuts Off in 8 Seconds—It takes 8 seconds for this condenser to discharge. If the arc is not struck within this 8-second interval, the discharge of the condenser opens another relay which turns off the gas and water valves. If the arc is struck within 8 seconds, the gas and water valves are kept open until the arc is broken. At that moment the automatic timing cycle is established.

The 8-second interval is an inherent property of the condensers selected and is inevitably sequenced when the arc is broken regardless of what the operator does or does not do. Although 5 seconds is sufficient time to cool the electrode to safe temperature, it was found that an 8-second timing was better co-ordinated with the welder's work habits. In 8 seconds he could break the arc, shift the work and resume welding without having to re-establish the timing cycle with his foot pedal.

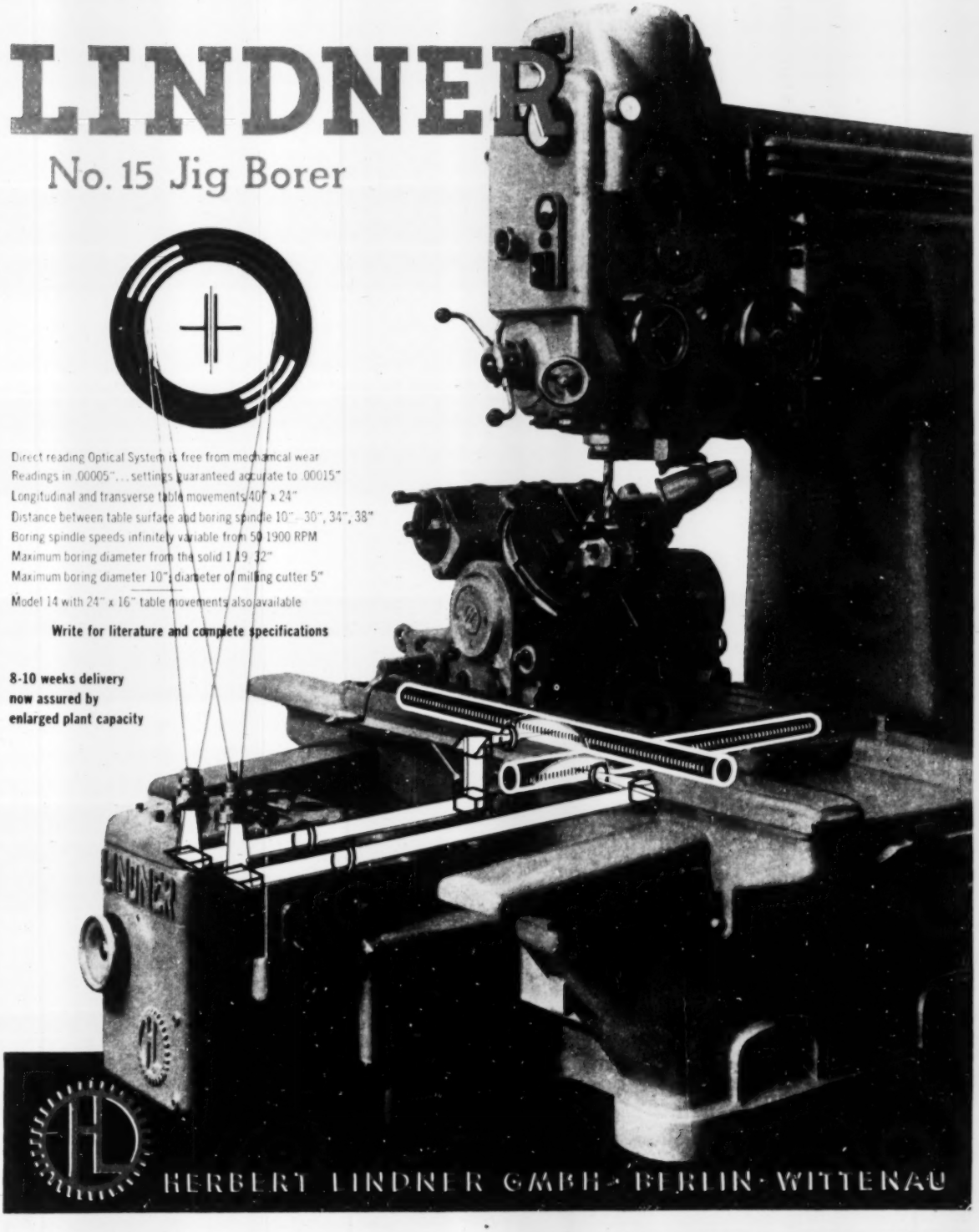
Not Voltage Sensitive — Unlike some commercial controls, this unit is not sensitive to voltage. Consequently it is not rendered inoperative if the welder raises the foot pedal after striking the arc or when the voltage is deliberately reduced near the end of the weld seam. Also, it does not have to be adjusted in order to respond to the different voltages required.

It is completely positive and automatic under all welding conditions and requires no attention from the welder. He cannot strike the arc unless the gas and water valves in the control are open thus eliminating the hazard of burning the valuable tungsten electrode. He is relieved of all concern about supervising the gas flow and can devote his skill to the welding itself.

Ryan has developed a hang-up switch which disengages the timing control from the welding equipment for use on twenty machines where both Heliarc and metallic arc welding are performed from the same generators. The operator can switch from Heliarc to metallic arc welding by simply hanging up one torch and picking up the other.

LINDNER

No. 15 Jig Borer



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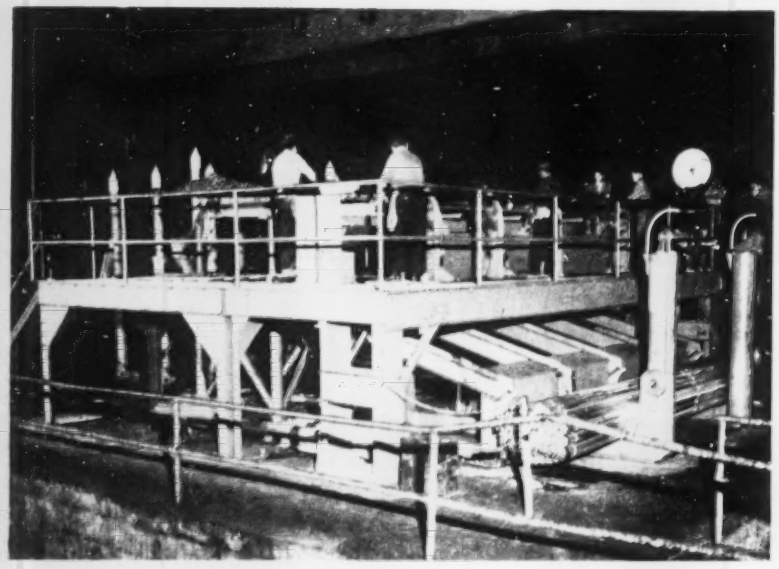

BUNDLING CONTINUOUS WELD STEEL PIPE

. . . loads are lowered by gravity into cradles at floor level

Mechanical Pipe Handler: Fewer Steps, No Backache

ELEVATED steel platform has saved considerable walking and lifting during continuous weld steel pipe bundling at Spang-Chalfant Division's plant in Etna, Pa. Pipe averages 21 to 22 feet long, is put into bundles ranging from 12 pieces for ½-inch to three pieces for 1½-inch.

Three men tie each bundle one at each end, one in the middle. Formerly, the middle bundler had to walk half the length of the pipe to get out of the way after a bundle was tied. Then the end men lifted the bundle manually and dropped it into cradles behind the middle man.

Use of the elevated platform at this National Supply Co. division permits each bundle to be lowered by gravity into cradles attached to a platform at floor level. Bundles pass under the middle bundler making it unnecessary for him to move from his position. Neither is it necessary for the men to lift the pipe physically.

Four Skid Rails—The bundling table consists of four skid rails. Lifts of pipe are placed on these rails. A bundling wheel at the end of each skid consists of a steel disk, 20 inches diameter, with three nests cut into it.

After a bundle has been tied in the nests, a bundler presses a foot pedal and bundling wheels index one-third revolution. This automatically discharges the bundle and brings the next nest of grooves into position to receive the succeeding lot of pipe. Special indexing mechanism insures that bundling nests stop in the correct position after each cycle.

Remote Weight Recorder—A 15-ton Howe scale, installed in conjunction with the bundling bench, is equipped with a Teleprint remote weight recorder. Weight of each lift is recorded in the continuous weld finishing mill office as soon as it is placed on the scale. Result is continuous accurate weight and count records.

ASTE Schedules Purdue Session

A panel discussion on "Hard to Machine Materials," reports on special research on grinding geometric sections and a tour of the school's new machine tool laboratory, will feature the tool engineering conference at Purdue University, Lafayette, Ind., Apr. 18. Sponsored by Indiana chapters of American Society of Tool Engineers, the technical session is part of the society's national education program.

CALENDAR
OF MEETINGS

March 24-25, Liquefied Petroleum Gas Association: Annual Southeastern district convention & trade exhibit, Hotel Biltmore, Atlanta. Association address: 11 S. LaSalle St., Chicago 3. Publicity: Robert E. Borden.

March 25-27, American Society for Metals: Western metals congress & exposition, Pan-Pacific Auditorium, Los Angeles. Information: 7619 Beverly Blvd., Los Angeles. Society address: 7301 Euclid Ave., Cleveland 3. Secretary: W. H. Eisenman.

March 25-27, National Association of Power Engineers Inc.: Annual spring meeting and exhibit, Hotel Sherman, Chicago. Association address: 176 W. Adams St., Chicago 3. Secretary: A. F. Thompson.

March 25-27, Pressed Metal Institute: Annual meeting, Hotel Carter, Cleveland. Institute address: 2860 E. 130th St., Cleveland 20. Managing director: Orrin B. Werntz.

March 25-27, Society of Automotive Engineers: National production meeting, Hotel Statler, Cleveland. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

March 26-27, Instrument Society of America and Carnegie Institute of Technology: Iron & steel instrumentation conference, Hotel Roosevelt, Pittsburgh. Society address: 921 Ridge Ave., Pittsburgh 12. Secretary: Richard Rimbach.

March 31-April 2, The Magnesium Association: International magnesium exposition, National Guard Armory, Washington. Association address: 122 E. 42nd St., New York 17. Secretary: Martha I. Hanson.

April 9-11, Lead Industries Association: Annual meeting for members, The Greenbrier, White Sulphur Springs, W. Va. Association address: 420 Lexington Ave., New York 17. Secretary: Robert L. Ziegfeld.

April 12-15, American Supply & Machinery Manufacturers Association: Annual meeting and conference booth program, Hotel Columbus, Miami, Fla. Association address: 814 Clark Bldg., Pittsburgh 22. Secretary: R. Kennedy Hanson.

April 12-16, Electrochemical Society Inc.: Annual spring meeting, Hotel Statler, New York. Society address: 235 W. 102nd St., New York 25. Secretary: Dr. Henry B. Linford.

April 13-15, International Acetylene Association: Annual spring meeting, Hotel Biltmore, Atlanta. Association address: 30 E. 42nd St., New York 17. Secretary: H. F. Reinhard.

April 13-15, American Society of Lubrication Engineers: Annual meeting and exhibit, Hotel Statler, Boston. Society address: 343 S. Dearborn St., Chicago 4. Secretary: William P. Youngclaus Jr.

April 14-15, Westinghouse Machine Tool Electrification Forum: Annual session, Hotel Statler, Buffalo. Information: E. F. Grapes, technical publicity, Box 2278, Pittsburgh 30.

April 14-16, Conveyor Equipment Manufacturers Association and University of Illinois Department of Engineering: Conveyor institute, University of Illinois, Champaign, Ill.

April 16-17, American Machine Tool Distributors Association: Spring meeting, Netherland Plaza hotel, Cincinnati. Association address: 1900 Arch St., Philadelphia 3. Secretary: Thomas A. Fernely Jr.

April 16-19, Grinding Wheel Institute: Spring meeting, The Homestead, Hot Springs, Va. Institute address: 2130 Keith Bldg., Cleveland 15. Manager: Hunter-Thomas Associates, Ie F. A. Peterson.

April 18-19, Packaging Machinery Manufacturers Institute: Spring meeting, Hotel Sherman, Chicago. Institute address: 342 Madison Ave., New York 17. Secretary: Helen I. Stratton.

April 20-22, AIME Blast Furnace, Coke Oven & Raw Materials Committee and National Open Hearth Steel Committee: Annual conference, Hotel Statler, Buffalo. Institute address: 29 W. 39th St., New York 18.

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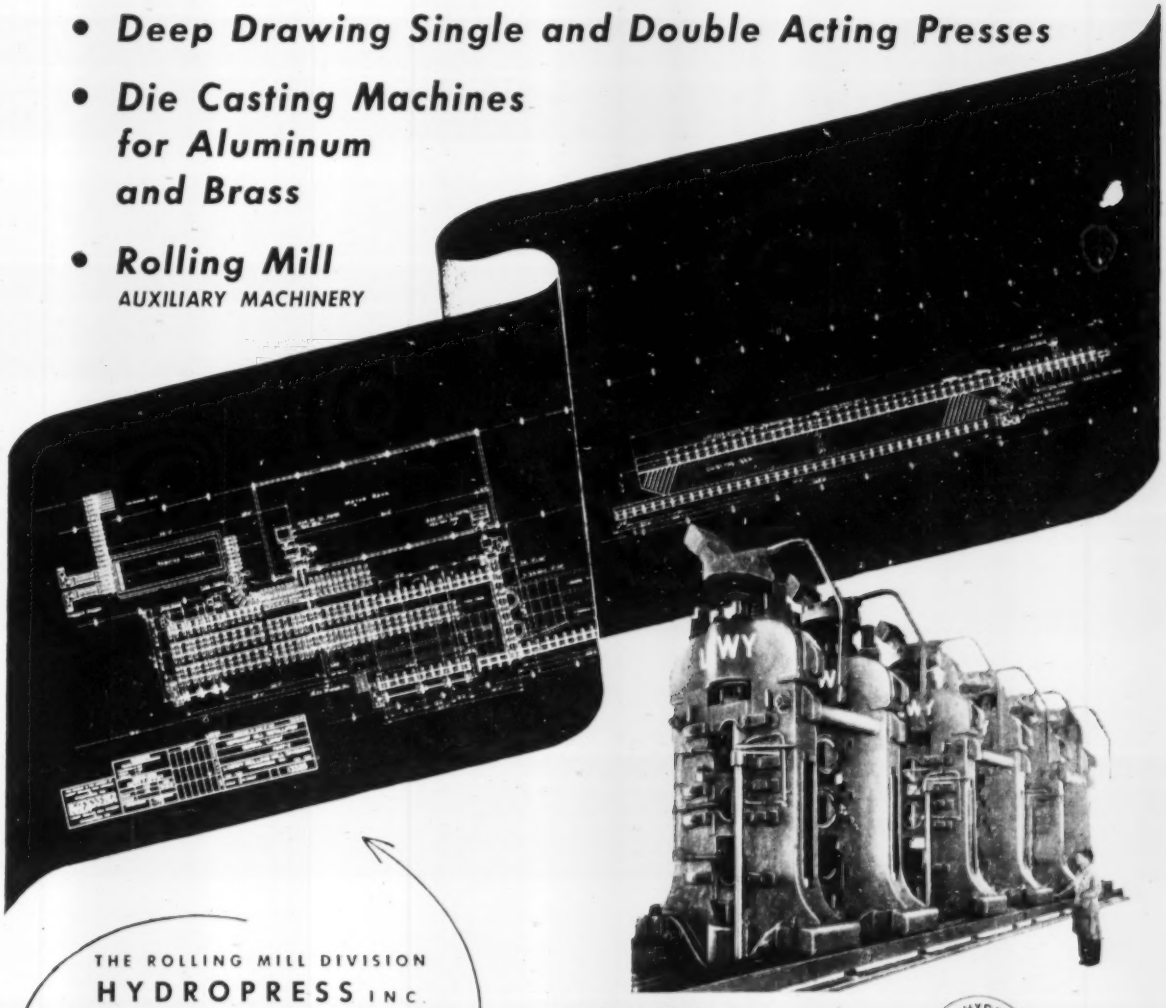

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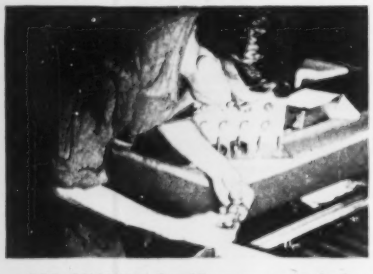

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Second, your ordering and stocking problems are greatly simplified, because *Pheoll offers the industry's most complete line* . . . by types, head styles, finishes and sizes. Centralized purchasing will eliminate follow-up and reduce your freight cost.

Finally, Pheoll fastener quality has been tops for nearly 50 years . . . contributes to the quality and acceptance of your own products. And with all of this, every order is driven through to speedy completion under close control in a modern, mechanized order-handling system.

Why waste time contacting several suppliers? End needless headaches . . . test Pheoll on your next call for threaded fasteners. See how *ONE* complete line . . . and dependable Pheoll service . . . can answer *ALL* of your production, delivery and purchasing problems!

PHEOLL

MANUFACTURING COMPANY

SCREWS
BOLTS
NUTS

5700 ROOSEVELT ROAD • CHICAGO 50, ILLINOIS

Manufacturers of

Machine Screws • Stove Bolts • Cap Screws • Wood Screws • Tapping (Sheet Metal) Screws • Threaded Rods • Set Screws • Drive Screws • Machine, Lag and Carriage Bolts • Brass Washers • Nuts • and many other fastener types

EXCEPTIONAL SERVICE ON *SPECIALS*, TOO! Many fasteners and other small parts can be produced faster, stronger and cheaper by cold working than by machining. Pheoll offers design assistance, huge production facilities, large raw material stocks . . . is set up to handle your jobs efficiently. For fast delivery on *specials*, call on Pheoll *first!*

MEN OF INDUSTRY

(Continued from Page 72)

Co., Detroit, was elected to the board of directors.

Kenneth J. Humberstone and **George F. Franck** were named vice presidents at **American Tank & Fabricating Co.**, Cleveland. Mr. Humberstone is in charge of engineering, manufacturing and sales. Mr. Franck manages the Elmwood avenue plant and is vice president in charge of steel warehouse sales, flame cutting and metallizing.

Charles T. Fettel was made assistant superintendent of the merchant-skelp mill, **Kaiser Steel Corp.**, Fontana Works, Fontana, Calif.

O. D. Niedermeyer was named a vice president of **Nickel Processing Corp.** and general manager of its nickel plant at Nicaro, Cuba. The company is jointly owned by National Lead Co., New York, and Cuban interests. The Texas Mining & Smelting Division of National Lead will be operated as a part of the company's metal department, mine and plant operations of which will be directed by **Gloyd M. Wiles**, mining department manager.

Richard J. Stockham was made president of **Stockham Valves & Fittings Co.**, Birmingham. He succeeds his brother, **Herbert C. Stockham**, now board chairman.

P. D. Shollar succeeds **Royce C. King**, retired, as manager of the procurement department of **Koppers Co. Inc.**, Pittsburgh.

Reynolds Metals Co. appointed **William P. Liljestrom** chemical specialist for its Pacific Coast region with headquarters in Los Angeles.

LeRoy A. Petersen, president, Otis Elevator Co., was elected a director of **American Locomotive Co.**, New York.

Arthur W. Lang was appointed manager of a new factory branch of **Trailmobile Inc.**, Dayton, O.

Wyman K. Ender joined the products engineering department of **Trane Co.**, La Crosse, Wis., to work on development of its hermetic centrifugal refrigeration units. He formerly was with Douglas Aircraft Co.

T. A. LEONHARDT
. . . a V. P. at Chandeysson Electric

WILLIAM E. SCHWARZ
. . . a V. P. at Chandeysson Electric

T. A. Leonhardt was elected vice president and plant superintendent, **Chandeysson Electric Co.**, St. Louis, and **William E. Schwarz** was elected vice president and engineering and plant manager.

Hugh L. Ruffner was elected vice president, **Columbia Iron & Metal Co.**, Cleveland.

Elliot Schick joined the engineering staff of **Ebert Electronics Co.**, Hollis, N. Y. He was chief industrail engineer of Emerson Radio & Phonograph Corp.

William L. Lockridge, formerly with Bendix Aviation Corp., was appointed director of market development at **New York Air Brake Co.**, New York.

William C. Davidson was appointed abrasive engineer for the West Virginia territory by **Norton Co.**, Worcester, Mass.

Richard Kinder was appointed national account representative, **Hyster Co.**, with offices at Chicago.

Graybar Electric Co. appointed **J. W. Riddell** manager of the Reading, Pa., branch to succeed the late **T. J. Hopkins. H. E. Orr** was made operating manager at the Amarillo, Tex., branch.

Pacific Airmotive Corp., Burbank, Calif., appointed **William Maxfield** assistant to L. B. Littrell, vice president-aircraft and engines. **Galen Potter** was named Burbank aircraft division manager, and **Robert D. Brahm** was promoted to assistant division manager, Chino, Calif., plant.

Fred S. Middleton was appointed sales manager, **DeBardeleben Coal Corp.**, Birmingham. He has been vice president, Production Foundries Division, Jackson Industries Inc.

William C. Tagmyer is northern California agent for **Tubesales**, with office in San Francisco.

John E. Mattos, resident technical field representative at Stockton, Calif., for **Columbia-Geneva Steel Division**, U. S. Steel Corp., was promoted to manager-heavy products sales with jurisdiction over 11 western states.

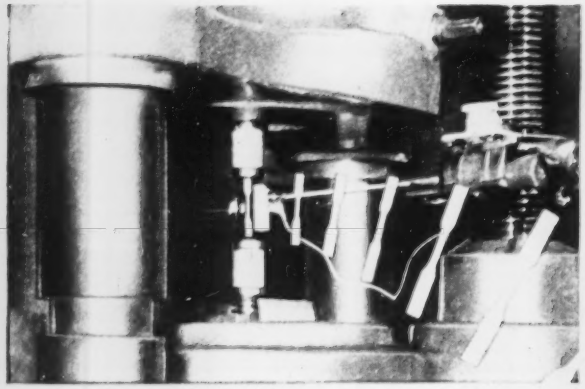
Edward N. Ryan was made assistant manager, New York branch sales office, **Crucible Steel Co. of America**, Pittsburgh.

Edward V. O'Neil was appointed controller, continuing as sales manager at **Donner-Hanna Coke Corp.**, Buffalo.

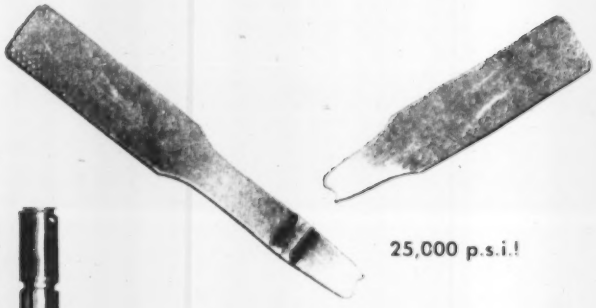
Gilbert B. Valentine was appointed sales manager, technical processes, Promat Division, **Poor & Co.**, Waukegan, Ill. **W. F. Mooney** was made sales manager, industrial products, and **C. J. Davoli** eastern service manager working out of the office of Reynolds-Robison Supply Co., Philadelphia.

Victor H. Davidson was elected

(Please turn to Page 102)



AT THE FRONTIERS OF PROGRESS YOU'LL FIND...



25,000 p.s.i.!

"STRETCHING" METALS... the operation illustrated is a tensile strength test on a welded aluminum specimen. The Baldwin Universal testing machine used can exert tensile or compressive forces up to 300,000 pounds. An extensometer attached to the specimen transmits the strain (elongation) in the specimen to the recorder, mounted at the right, which draws a permanent graph of load vs. total strain. Part of Airco's continuing research and development program — this test indicates the unseen "performance insurance" you buy with every Air Reduction product and process!

OXYGEN • ACETYLENE • NITROGEN • OTHER INDUSTRIAL AND RARE GASES • OXYACETYLENE WELDING AND CUTTING APPARATUS

12 MINUTES DOES YESTERDAY'S PROBLEM JOB!

They couldn't have done it this way a few years back. That box is made of 1/16" 52S aluminum — a problem alloy to weld. Today, with Airco Machine Heliwelding, a prominent electronics company turns out one of these case boxes every twelve minutes. The four 15" seams that join the bottom pan to the sides take about 45 seconds each, as the Machine Heliweld Holder moves smoothly over them, carried by an Airco No. 20 Radiagraph. Heliwelding provides pin-point heat concentration for joining hard-to-weld metals . . . with a minimum of finish grinding.

And remember, when you need oxygen, acetylene, nitrogen and other industrial or rare gases, think of Air Reduction. Uniform-wide industrial distribution system is ready to supply your needs.

AIR REDUCTION

DEALERS AND OFFICES IN MANY PRINCIPAL CITIES

60 East 42nd Street • New York 17, N. Y.

Air Reduction Sales Co. • Air Reduction Magnolia Co. • Air Reduction Pacific Co.
Represented Internationally by Airco Company International

Divisions of Air Reduction Company, Incorporated

CALCIUM CARBIDE • ARC WELDING AND INERT-GAS ARC WELDING EQUIPMENT • WELDING SUPPLIES AND ACCESSORIES

JACK W. HARVEY
Manco Mfg. sales manager

ELLIS J. O'BRIEN
Heyl & Patterson engineering post

HAROLD E. ROWEN
Sintering Machinery v. p.

(Continued from Page 99)

chairman of the board, **L. C. Smith & Corona Typewriters Inc.**, Syracuse, N. Y. He is executive vice president of the firm.

Jack W. Harvey, formerly assistant sales manager in charge of the Chicago territory for **Manco Mfg. Co.**, Bradley, Ill., was appointed sales manager for the firm.

John D. Hantz was named executive vice president, and **Glenn G. Buzza** and **Charles A. Dally** vice president of **Continental Equipment Co.**, Coraopolis, Pa.

Cleaver-Brooks Co. appointed **J. H. Ballenger**, Cincinnati, as a manufacturer's representative for the sale of its boiler equipment.

Ellis J. O'Brien was appointed chief development engineer of **Heyl & Patterson Inc.**, Pittsburgh. He will direct activities of the research and development department. Before joining Heyl, Mr. O'Brien was with Vanadium Corp. of America for 14 years.

J. A. McCabe was appointed general production manager of **Ford Motor Co.'s** aircraft engine division, Cicero, Ill. He was with the tank division at Livonia, Mich.

Leonard Brooks was made factory manager of **Cannon Electric Co.'s** Los Angeles plant to replace **John Trotter**, resigned.

R. H. Winkler was made assistant manager, sales promotion department, for systems-photo records, products of **Remington Rand Inc.**, New York.

Harold E. Rowen, vice president and general manager, **Sintering Machinery Corp.**, Netcong, N. J., assumed the additional duties of directing sales of the company's metallurgical division.

Midvale Co., Philadelphia, appointed **Frank R. Romeo** superintendent of its roll hardening department.

Lou R. Gallas was made sales engineer for electropolishing processes and installations by **Electro-Glo Co.**, Chicago.

Delta Power Tool Division, Rockwell Mfg. Co., Pittsburgh, appointed **Otto Schmidt** midwestern drill unit sales representative, with headquarters at La Grange Park, Ill.

M. S. Phoenix of **F. E. Anderson Oil Co.'s** Lusol tool engineering staff, Portland, Conn., was named chief engineer for the firm.

Edwin C. Evans, who joined **Behr-Manning Corp.**, Troy, N. Y., in 1934 and since last October has been director of manufacturing, was elected a member of the board of directors.

A nondestructive testing department, headed by **Alexander Gobus**, was established by **North American Philips Co. Inc.**, Mt. Vernon, N. Y., to handle new research developments in the industrial x-ray field. He has been vice president, chief metallurgist and director of nondestructive testing, Sam Tour & Co. Inc.

A. C. Brown Jr., Pittsburgh regional manager, **Air Reduction Sales Co.**, was appointed general sales manager with headquarters in New York. He is succeeded by **J. H. Keeney**, who was administrative assistant in Pittsburgh. **J. H. Hart**, Detroit district manager, succeeds Mr. Keeney and **R. A. Jamieson** succeeds Mr. Hart.

L. Harriss Robinson was appointed manager of the Washington office of **Motorola Communications & Electronics Inc.** **John Fussell** fills the position of manager of Region 7, vacated by Mr. Robinson.

Damascus Tube Co., Greenville, Pa., appointed **M. M. Mossman** as its agent in northwestern United States.

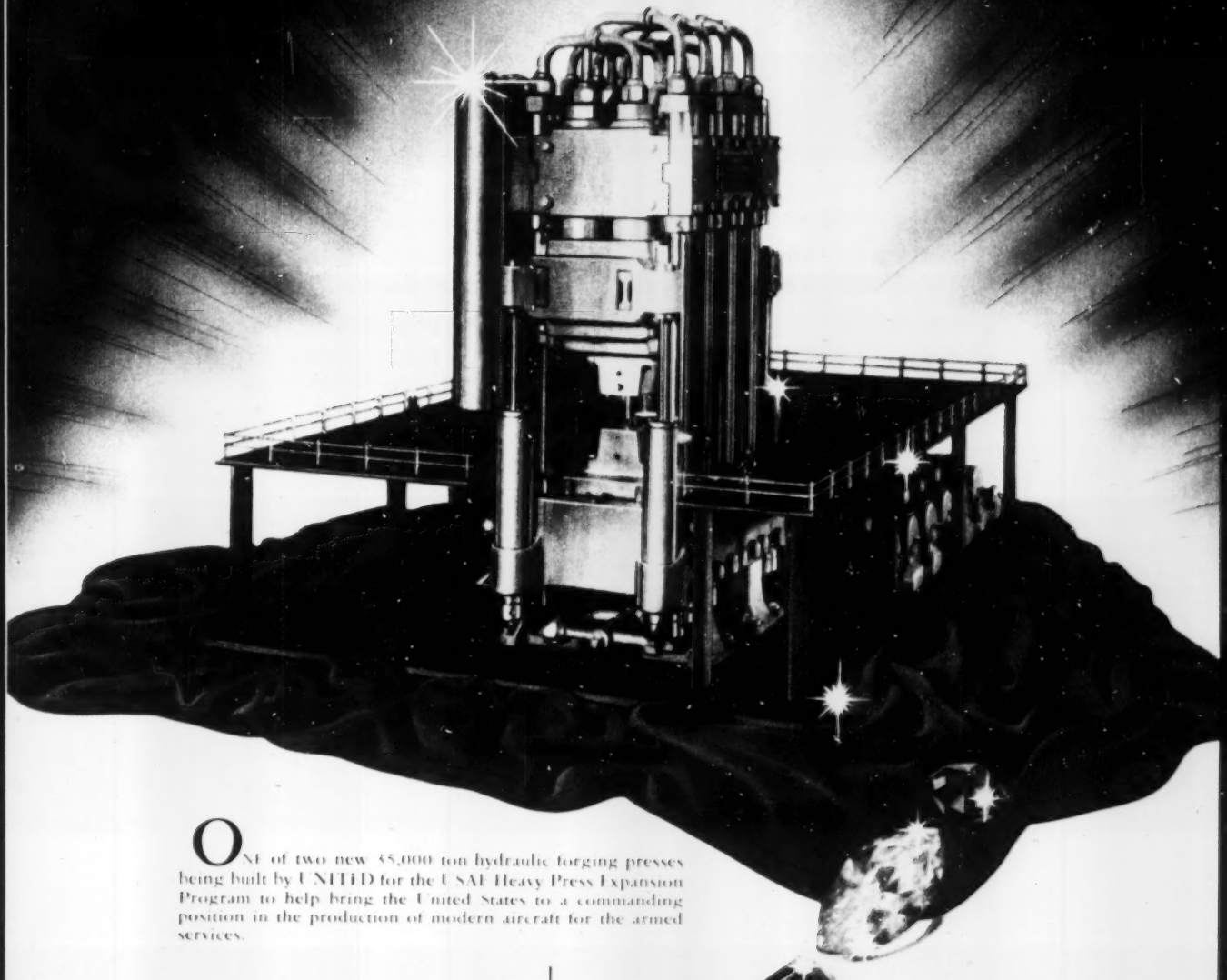
William J. Heintz, Baltimore, Md., was named to represent **American Shear Knife Co.**, Homestead, Pa., **Automatic Nut Co. Inc.**, Lebanon, Pa., and **Hoyt Wire Cloth Co.**, Lancaster, Pa.

Donald A. Hanan was appointed sales representative by **Peterson Steels Inc.**, Union, N. J., with offices in Detroit. He formerly covered the New Jersey territory.

Westinghouse Electric Corp. appointed **Edmund T. Morris** assistant manager, atomic power division, Pittsburgh. **Dr. Charles M. Slack** was named director of re-

UNITED

35,000 TON FORGING PRESS



ONE of two new 35,000 ton hydraulic forging presses being built by UNITED for the USAF Heavy Press Expansion Program to help bring the United States to a commanding position in the production of modern aircraft for the armed services.

UNITED

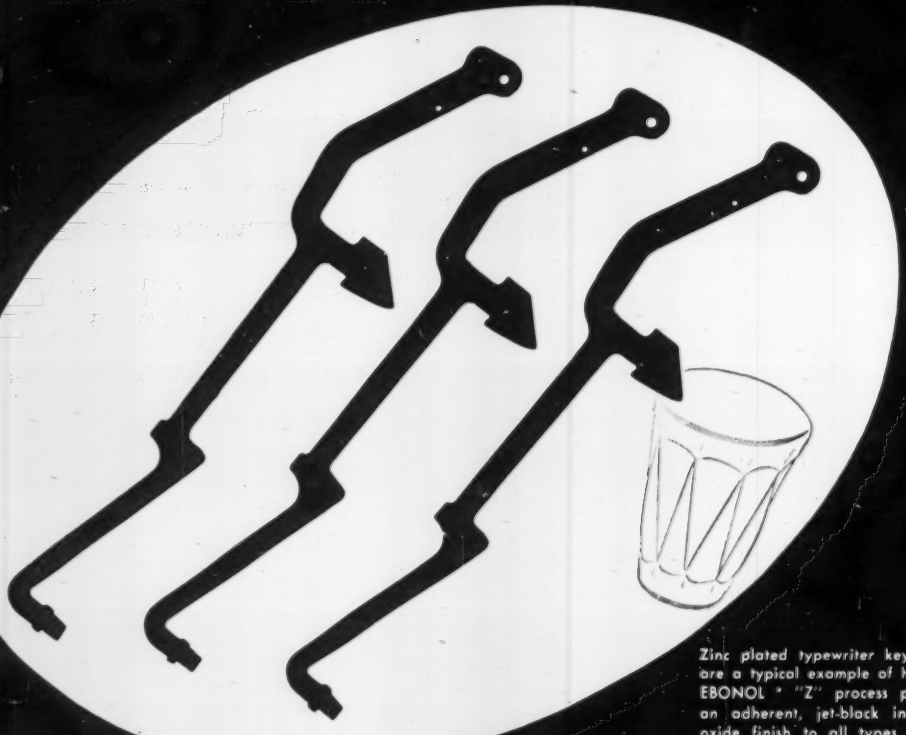
ENGINEERING AND FOUNDRY COMPANY

Pittsburgh, Pennsylvania

Plants at Pittsburgh • Vandergrift • New Castle • Youngstown • Canton
Subsidiaries: Adamson United Company, Akron, Ohio
Lobdell-United Company, Wilmington, Delaware
Stearns Foundry and Machine Company, Inc., Aurora, Indiana

Designers and Builders of Ferrous and Non-Ferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.

JET BLACKS



Zinc plated typewriter key levers are a typical example of how the EBONOL * "Z" process provides an adherent, jet-black inorganic oxide finish to all types of zinc plated surfaces.

*Reg. Trade Mark

For blackening metals use ENTHONE EBONOLS

EBONOL "S" Processes for blackening steel to produce jet-black oxide coatings. Simple and economical to operate. Operating temperatures: EBONOL "S", 285-290 F., EBONOL "S-30", 295-305 F.

EBONOL "C" The quality black for copper and brass that meets all military specifications. Produces cupric oxide finishes that are stable, adherent and protective.

EBONOL "Z" A durable, deep, rich finish for zinc plate or zinc alloy castings. Dull or glossy oxide black coatings are formed in from 5 to 10 minutes at 160-180 F.

U. S. PATENT NOS. 2,364,993, 2,460,896, 2,460,898, 2,481,854.

Write to Enthone, Inc. for information and advice on any blackening process and ask for check list of Enthone literature on over sixty products and processes for better electroplating and metal finishing.

METAL FINISHING PROCESSES

ENTHONE

ELECTROPLATING CHEMICALS

442 ELM STREET
NEW HAVEN, CONNECTICUT

DAN STEARNS
. . . heads new Clark Equipment region

search and engineering of the lamp division at Bloomfield, N. J.

Dan Stearns will head the newly created midwestern region of **Clark Equipment Co.** with headquarters in the Chicago office. He will be assisted by **Glen R. Jonhson,** for the last six years one of Clark's national account representatives.

H. F. Black Equipment Co., Cleveland distributor for Elwell-Parker Electric Co., appointed **John R. Hogan** as a sales agent for northeastern Ohio and Erie, Pa.

Frank E. Golliher was named manager of **General Electric Co.'s** plastics molding plant at Decatur, Ill. He replaces **Henry Semler,** now on the staff of J. L. McMurphy, general manager of the plastics department.

David A. Coulter was elected a vice president, **Brenholts, Goin & Ogg Inc.,** Pittsburgh.

Herbert P. Dales was appointed sales manager and **Carl L. Adelman** assistant sales manager, coated products division, **Carborundum Co.** They will have headquarters at the division offices, Wheatfield, N. Y. In the industrial abrasive sales division, **Russell P. Colosi** becomes assistant to the Cleveland district sales manager; **Charles J. Walter** office manager, Cleveland district; **Wilfred Robson** office manager, Los Angeles district sales office; and **Joseph A. Marrone,** assistant office manager, Chicago district sales office.

Walter Lohman was appointed manager, material control division, **Heil Co.,** Milwaukee. He formerly was director of purchases at Nesco Inc.

John Persich was appointed assistant superintendent at the Los Angeles plant, **U. S. Steel Products Division,** U. S. Steel Corp.

William M. Tinnon was named sales manager, **Drawalloy Corp.,** York, Pa.

Thomas A. Downie, Erie, Pa., was appointed sales engineer in the northern Pennsylvania territory for **Wm. K. Stamets Co.,** Pittsburgh.

Robert Lowry was appointed by **Goodyear Aircraft Corp.,** Akron, to co-ordinate computer sales activities. He was contract administrator in government project sales department and is replaced by **George Rodway.**

Craig C. Carpenter was made assistant general sales manager, **Soule Steel Co.** at San Francisco.

WORK MOVES FASTER
COSTS LESS with a Fray
No. 10-R UNIVERSAL RAM • TURRET TYPE • VERTICAL
MILLING MACHINE
You get a wider work range than with any other machine this size. You can machine at any angle—vertical, horizontal or both. You can mill, drill or bore at any angle. Hence resetting isn't necessary. Just change the machine—changing is quick. (For vertical and regular horizontal milling, use the 10 RH.) Jobs are done faster and better . . . at less cost. • It's Universal • Rugged • Easy to Operate.
A high precision tool.
Write for details and specifications.
Bulletin 10.
FRAY "ALL-ANGLE" HEAD
TYPE 4
For deep, heavy cuts. Permits working to extra close limits. Any angle up to compound 2-way. Request Bulletin 4.
FRAY
All-Angle
FRAY MACHINE TOOL CO.

Powerful, Productive and Low with Spring-Loaded Pitman

• **The NEW Alliance 12-ton, low-type open hearth** Charging **Machine has spring-loaded** pitman so, if the charging box pushes up **over** scrap in the furnace, the trolley's front wheels remain on the **rails.** Trolley always has sufficient traction to retract peel and **box from** furnace.

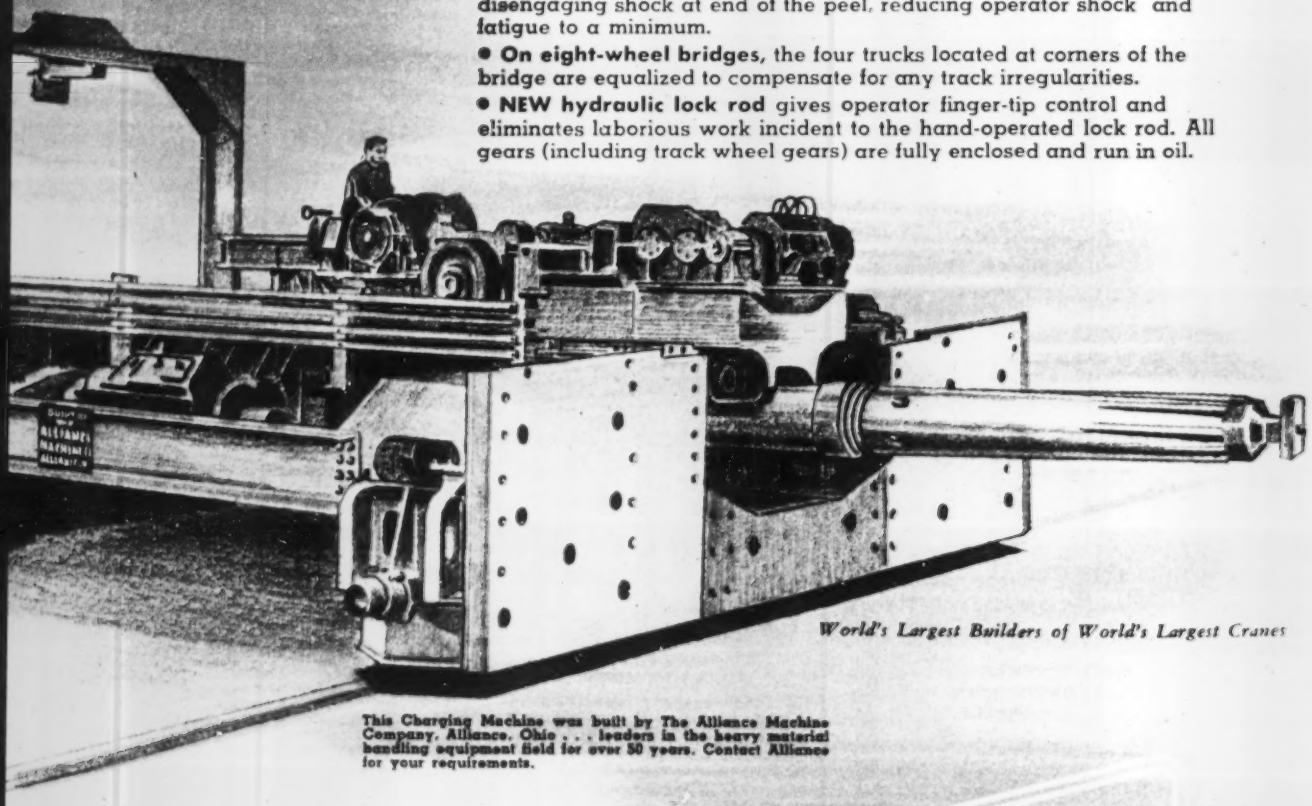
• **Each bridge girder** of Alliance's NEW Charging Machines consists **of two** wide-flanged I-beams welded to form a box section. Between **webs of** this box section, diaphragms are welded at 3-ft. intervals. **This, plus** other welded reinforcements, keeps charging machine **square and** rigid.

• **Machinery deck plate,** extending full length of bridge between **main** girder and outrigger girder laterally reinforces the main girder **and helps** keep charging machine square and stable under all **operating** conditions.

• **Stabilized, shock-absorbing wheels** operate at rear end of trolley. Two rear wheels engage upper rail; two adjacent wheels engage lower rail. Powerful springs hold wheels in contact with rails at all times. This spring suspension absorbs and disperses engaging and disengaging shock at end of the peel, reducing operator shock and fatigue to a minimum.

• **On eight-wheel bridges,** the four trucks located at corners of the bridge are equalized to compensate for any track irregularities.

• **NEW hydraulic lock rod** gives operator finger-tip control and eliminates laborious work incident to the hand-operated lock rod. All gears (including track wheel gears) are fully enclosed and run in oil.



World's Largest Builders of World's Largest Cranes

This Charging Machine was built by The Alliance Machine Company, Alliance, Ohio . . . leaders in the heavy material handling equipment field for over 50 years. Contact Alliance for your requirements.

LADLE CRANES · GANTRY CRANES · FORGING MANIPULATORS · SOAKING PIT CRANES
STRIPPER CRANES · SLAB AND BILLET CHARGING MACHINES · OPEN HEARTH CHARGING
MACHINES · SPECIAL MILL MACHINERY · STRUCTURAL FABRICATION · COKE PUSHERS

THE ALLIANCE MACHINE COMPANY

Main Office, ALLIANCE, OHIO · Pittsburgh Office, 1622 OLIVER BLDG., PITTSBURGH, PA.

Alliance

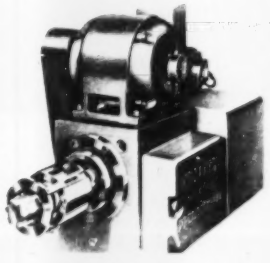
NEW PRODUCTS and equipment

Reply cards on page 121 will bring you more information on any new products and equipment in this issue

Precision Threading Unit

. . . an automatic power package

This threading unit provides a fully automatic power unit with direct precision lead, rapid tool spindle return and variable speeds. Its hardened and ground spindle is driven by a 3 hp motor. Precision lead is maintained through-



out the entire 4-inch feed travel by hardened and ground quick change lead screw and collapsible lead nut head.

At the end of feed travel, the nuts are disengaged automatically and rapid spindle return is obtained through a planetary gear clutch. Sheffield Corp., Dept. ST, Dayton 1, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 1

Universal Industrial Cleaner

. . . applied by spray gun

Applied by hand-size pressure spray gun, this universal industrial cleaner removes the full range of grease, oil, gum and dirt with complete safety to all metals, plastics, rubber or porcelain. It gains rapid cleaning without heat, odor, fumes, fire-hazard or danger to skin.

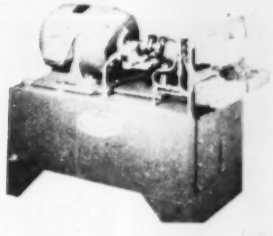
Cleaning jobs are completed simply by spraying material and wiping without hard rubbing or scouring. Spray gun can be charged with air from any source and refilled in a few seconds. Kelite Products Inc., Dept. ST, 1250 N. Main St., Los Angeles 12, Calif.

FOR MORE DATA—CIRCLE REPLY CARD NO. 2

Hydraulic Power Unit

. . . 12 gpm pump; 7½-hp motor

This hydraulic power unit consists of a 12-gpm pump and 7½-hp motor. The tank holds 50 gallons, is equipped with a filter, breather, oil level gage and baffles. Also in-



cluded in the assembly are three panel-mounted, solenoid operated, four-way control valves and relief valve. J. N. Fauver Co. Inc., Dept. ST, 49 W. Hancock, Detroit 1, Mich.

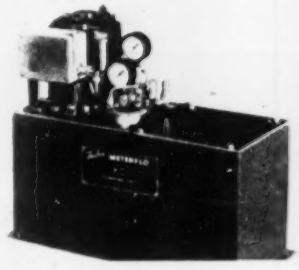
FOR MORE DATA—CIRCLE REPLY CARD NO. 3

Oil Circulating System

. . . controls flow to bearings

Oil circulating system, called Meterflo, employs the manufacturer's positive piston displacement principle to control oil flow to every bearing under pressure. The system features flow rates up to 80 cfm. Rotary type pump units are available in complete range of discharge capacities.

Pump units, with or without sumps, include motor, pump, dual-pressure switch, cartridge-type filter pressure and oil level gages and fill screen. Sumps have removable baffles for easy tank cleaning. Pair of constantly blinking lights, actu-



ated by oil flow, is available as optional signal equipment. Trabon Engineering Corp., Dept. ST, 1814 E. 40th St., Cleveland 3, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 4

Single-Pad Finishing Sander

. . . 4500 strokes per minute

This air sander weighs only 4 pounds, has smaller palm-size grip for maximum operator comfort. Automatic mist-type water spray is used for wet sanding. Abrasive holder can be employed easily for attaching several sheets of sandpaper at one loading. The sander operates at 4500 strokes per minute on 50 to 60 pound air pressure.

Slide action design for attaching sanding pads allows for 2-inch off-center pad adjustments. Off-center pad position permits sanding in grooves, up to protruding trim and in other difficult areas. Detroit

Surfacing Machine Co., Dept. ST, 1333 E. Eight Mile Rd., Detroit 20, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 5

Welder's Rule

. . . brake holds extended tape

Atlas Chief is a 10-foot, spring recoil type steel rule. It has the strength necessary to resist collapsing when extended either horizontally or vertically. Cumulative inches as well as feet are clearly indicated. An automatic brake holds extended tape at any point. Atlas Welding Accessories Co., Dept. ST, 707 E. Lewiston St., Ferndale 20, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 6

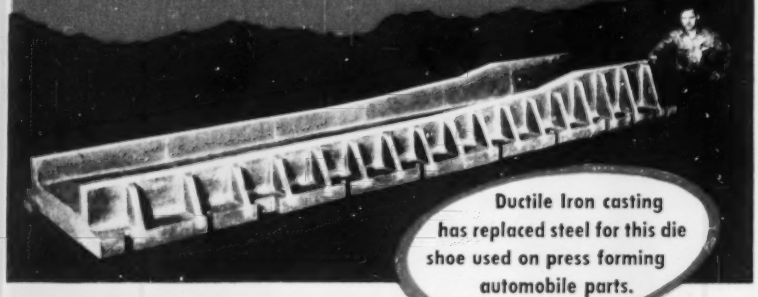
Flag Type Terminals

. . . made in eight wire sizes

Flag type solderless terminals are available for eight wire sizes from No. 8 to No. 4/0. Tongues are designed for a wide range of stud sizes. Made of pure copper, they are electro-tinned for maximum conductivity and surface protection. Terminals can be used with solid, stranded or irregularly shaped wires or combinations of these types. Aircraft-Marine Products Inc., Dept. ST, 2100 Paxton St., Harrisburg, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 7

DUCTILE IRON
NEW ENGINEERING MATERIAL

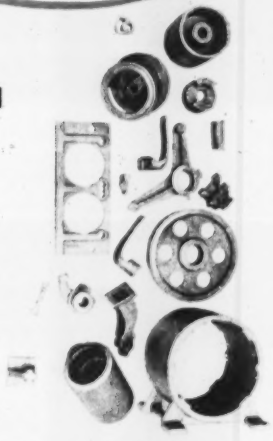


Ductile Iron casting has replaced steel for this die shoe used on press forming automobile parts.

TENSILE STRENGTH
60,000 PSI, to 115,000 PSI

ELONGATION
As cast: approx. 3%
Annealed: 15% to 22%

YIELD STRENGTH
45,000 PSI to 65,000 PSI



A variety of Ductile Iron castings

A pioneer in the production of this remarkable metal, the BELOIT FOUNDRY conducts a constant program of research and analysis to meet the growing demand for Ductile Iron. We will gladly answer inquiries about applications of Ductile Iron (or our other irons) to your products.

BELOIT FOUNDRY CO.
High test Iron, Alloy Irons, and Ductile Iron Castings from a fraction of a pound thru 50 tons
BELOIT, WISCONSIN

DETROIT OFFICE
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Phone Texas 4-1227

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Phone Radcliffe 3-4114

BF

Multiple Operation Drill Press

. . . long or short-run jobs

This production drill press is designed for multiple operations involving drilling, tapping, reaming, burring and chamfering. Built for efficiency on long production runs, its versatility is sufficient to handle short runs required in job

shop work. The press can use either a $\frac{1}{3}$ or $\frac{1}{2}$-hp motor.

Approximate spindle speeds range from 720 to 4325 rpm. Maximum capacity is 7 inches from spindle to column and 18 inches from chuck to table. A drill head positioning attachment gives each drill head assembly 4 inches of vertical adjustment at any setting. Four types, equipped with one to four drill heads, are available. South Bend Lathe Works, Dept. ST, 125 E. Madison St., South Bend 22, Ind.

FOR MORE DATA—CIRCLE REPLY CARD NO. 8

Heat Treating Furnace

. . . temperatures reach 3100° F

Temperatures up to 3100 F can be obtained in this metallurgical heat treating furnace. A water-jacketed chamber permits work to be cooled as well as heated in a protective atmosphere. The furnace uses either hydrogen or dis-

...with TYCOL lubricants on hand!

Take metal fabrication, for example. There's a Tycol lubricant for any application you can name: For instance, what about tough machining jobs? . . . Tycol Afton cutting oil keeps cutting edges cool . . . lengthens tool life between grinds. Machine tool hydraulic systems? . . . Tycol Aturbrio oxidation and rust inhibited oils keep them running smoothly. Open gears of metal forming equipment? . . . Tycol Amaclac lubricants cling like cat hair on a serge suit. You always get top performance with Tycol lubricants. Why? . . . Because each Tycol grease and oil is manufactured from high quality base stocks and *tailored* for a specific application. Get the full story of the entire Tycol line from your local Tide Water Associated office today!

Over 300 Tycol industrial lubricants are at your disposal . . . engineered to fit the job!

REFINERS AND MARKETERS OF VEEDOL . . . THE WORLD'S MOST FAMOUS MOTOR OIL

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INDUSTRIAL LUBRICANTS

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Tulsa • Cleveland • San Francisco
Toronto, Canada

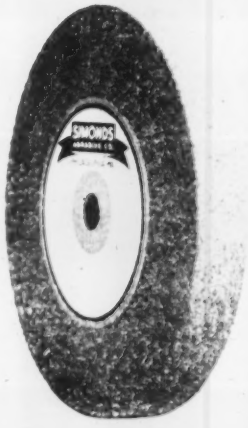
TIDE WATER ASSOCIATED OIL COMPANY
17 BATTERY PLACE - NEW YORK 4, N.Y.

"Just like a grinding wheel!"

SIMONDS ABRASIVE CO.

Grinding Wheels

He's right! A grinding wheel's cutting particles *are* embedded like currants in a bun. But there's more than that to Simonds wheels. The cutting particles are scientifically processed by Simonds. They're accurately sized. They're evenly distributed. Their spacing in the wheel bond is controlled for maximum cutting efficiency on specific grinding jobs. This controlled quality assures *you* of superior performance each time *you* order Simonds grinding wheels, mounted wheels, segments or polishing grain. Write for data book and name of your distributor.



SIMONDS ABRASIVE CO., PHILADELPHIA 37, PA. BRANCH WAREHOUSES: CHICAGO, DETROIT, BOSTON
DISTRIBUTORS IN PRINCIPAL CITIES

Division of Simonds Saw and Steel Co., Fitchburg, Mass. Other Simonds Companies: Simonds Steel Mill's, Lockport, N. Y., Simonds Canada Saw Co. Ltd., Montreal, Que. and Simonds Canada Abrasive Co., Ltd., Arvida, Que.

sociated ammonia. Four manually-operated, counterbalanced doors separate charging, heating and cooling chambers. Work is handled on trays and manipulated by push and pull rods.

Cooling chamber is constructed of welded steel plates to incorpo-

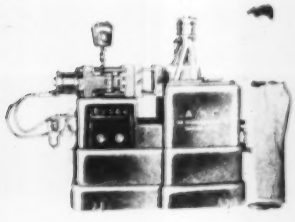
rate a water jacketed housing. Heating elements are formed from heavy molybdenum alloy rod into sinuous loops and supported on alundum refractories. Hearth is made of molybdenum alloy. Protective atmosphere consumption is between 150 and 200 cu ft per hour. Westinghouse Electric Corp., Dept. ST, Box 2099, Pittsburgh 30, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 9

Small Zinc Die Caster

. . . exceeds 1000 shots per hour

Weight of metal per shot is 1½ pounds in this zinc die casting machine, built for smaller castings and short runs. The machine was designed specifically for companies who do not require large equip-



ment, but need fast cycling to produce small castings and accommodate short run production.

The air-operated machine is capable of a free cycling speed in excess of 1000 shots per hour. In addition to easy setup and operation, higher production speed makes single cavity molds practical and profitable. Other features: An

electronically controlled panel and semiautomatic cycling with adjustable timing dwell on opening and closing of toggle. ABC Die Casting Machine Co., Dept. ST, 339 W. 112th Place, Chicago 28, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 10

Automatic Sand Controller

. . . compensates for evaporation

Two sequence controllers, models 3881 Watertemp and 3884 Automull, broaden the manufacturer's line of automatic sand controls. The Watertemp unit adds correct amount of water to each sand batch, compensating for hot sand evaporation. Provisions are also made for base water or clay slurry. Automatic sand mixing can be obtained by using the Automull sequence controller in conjunction with the Watertemp unit.

In addition, the model 3885 sand controller can be used to further refine moisture control on the basis of working properties of the sand. With the controller, a continuous record of tests for green strength and green permeability is available. Deformation and moisture are controlled at the optimum point. Harry W. Dietert Co., Dept. ST, 9330 Roselawn Ave., Detroit 4, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 11

Vacuum Insulating Blocks

. . . temperatures to 1900° F

Industrial high temperature insulating blocks are suited for temperatures up to 1900° F. Mineral wool fibers within the block are felted and compressed by special machinery, providing good

METALS

Because they are necessary to our way of life, people take appliances for granted. They expect them to work without constant adjustment or repair, and to last many years. That's why you'll find beryllium copper used in vital subassemblies of most appliances today. For parts and key numbers, see below.

SERVICE-FREE PERFORMANCE

Beryllium copper offers appliance makers design advantages plus greater reliability

For those manufacturers who take advantage of it, beryllium copper reduces failure, increases customer satisfaction. Temperature controls, timers, brush springs and motor overload relays made of Berylco beryllium copper can be depended on to work unerringly — don't require frequent service.

Beryllium moved out of the laboratory into industry when it was discovered that as little as 2 percent added to copper produced an alloy with remarkable properties. No other material meets to the same degree such diverse qualifications as conductivity, mechanical strength, endurance and elasticity. That's why Berylco has successfully solved design problems involving conflicting requirements for practically all industries.

Manufacturers find that these performance advantages can easily be converted into cost-saving ones as well. Where electrical circuits are involved, Berylco's ability to withstand high stresses makes simpler designs possible. Its elastic strength offers space-saving opportunities. Its formability permits easier fabrication.

Once regarded as rare, beryllium copper is now in plentiful supply. Manufacturers interested in using this versatile alloy are welcome to share the facilities and know-how of the world's largest producer. Write THE BERYLLIUM CORPORATION, Dept. 3C, Reading 19, Pa.

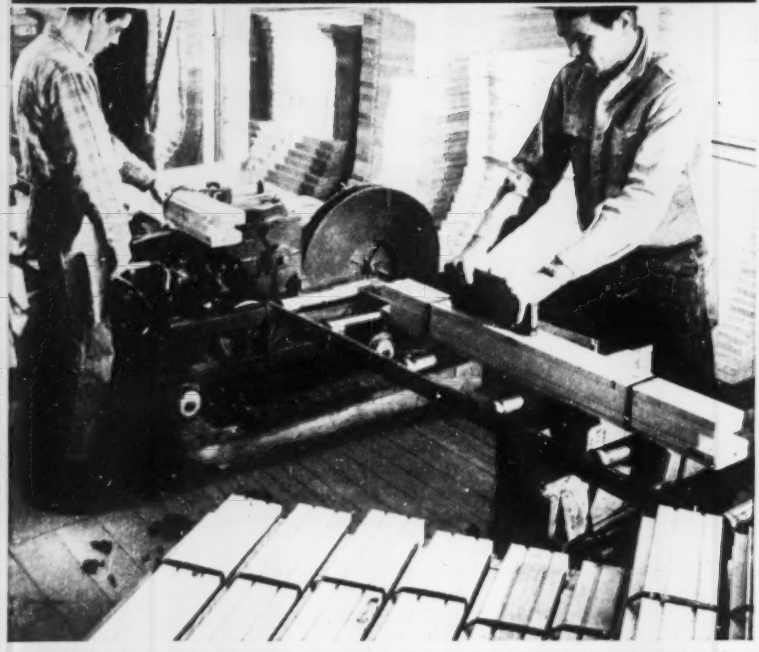
Tomorrow's products are planned today with Berylco beryllium copper

BERYLCO PARTS, AND WHERE THEY FUNCTION in the modern kitchen, can be seen by locating the corresponding number in the large photo on this page. The parts shown are: (1) temperature control; (2) oven control; (3) timer part; (4) brush spring; (5) overload relay; (6) toaster spring; (7) contact springs for refrigerators.

Advertisement

SLOWDOWN In Assembly?

Not when you bundle with a SIGNODE POWER STRAPPING MACHINE!



The happiest, most envied man on the production line—*and the pacesetter*—is the man on the *Signode Power Strapping Machine!* His job is easy and light, and well-strapped bundles roll off the line automatically! But faster continuous output is not the only advantage gained.

Power Strapping Cuts Costs Also

Signode's Power Strapping Machine releases several men for other jobs. It does the job of bundling safe and faster, with uniform tension on every strap. The machine is flexible, handling packages of varying sizes without adjustment. It is highly adaptable, strapping K.D. millwork, soft and hard wood flooring, shingles, crating lumber, expensive trim, etc. Strapped millwork and lumber is easier to handle, stack and tally. It can be loaded faster and enjoys protection from pilferage until used on the job.

Let's estimate your needs

Volume shippers usually have varying strapping needs. Let our fieldman survey your production layout and recommend the power strapping machine for the job. You'll be under no obligation whatever. Write

*Another exclusive service proved and tested for you by Signode

SIGNODE

Steel Strapping Company

2645 N. Western Ave., Chicago 47, Ill.

this seal means security in shipping

SIGNODE

Offices coast to coast
In Canada: The Canadian Steel Strapping Co., Ltd.
Foreign Subsidiaries and Distributors World Wide

NEW PRODUCTS and equipment

breaking strength and improved utility due to ease in handling. Lightness in weight offers fast and easy application. Eagle-Picher Co., Dept. ST, 900 American Bldg., Cincinnati 1, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 12

Portable Saw Blade Welder

. . . takes 1/16 to ¾-inch blades

Capacity of this portable band saw blade welder has been increased so the unit will buttweld all blades from 1/16 to 3/4-inch. This permits a wide work range from intricate internal tool and die to power cutoff saws. Complete welding

facility for all band saw blade types reduces filing time.

Built-in grinder is designed to remove flash from the weld. A double gage checks thickness of weld on flat saws. Portability makes it possible to serve a battery of band saws. Dimensions are 7¾ x 12 x 7 inches; weight, 31 pounds. Brennen Mfg. Co., Dept. ST, 676 59th St., Brooklyn 20, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 13

Truck Load Stabilizer

. . . higher loads, greater safety

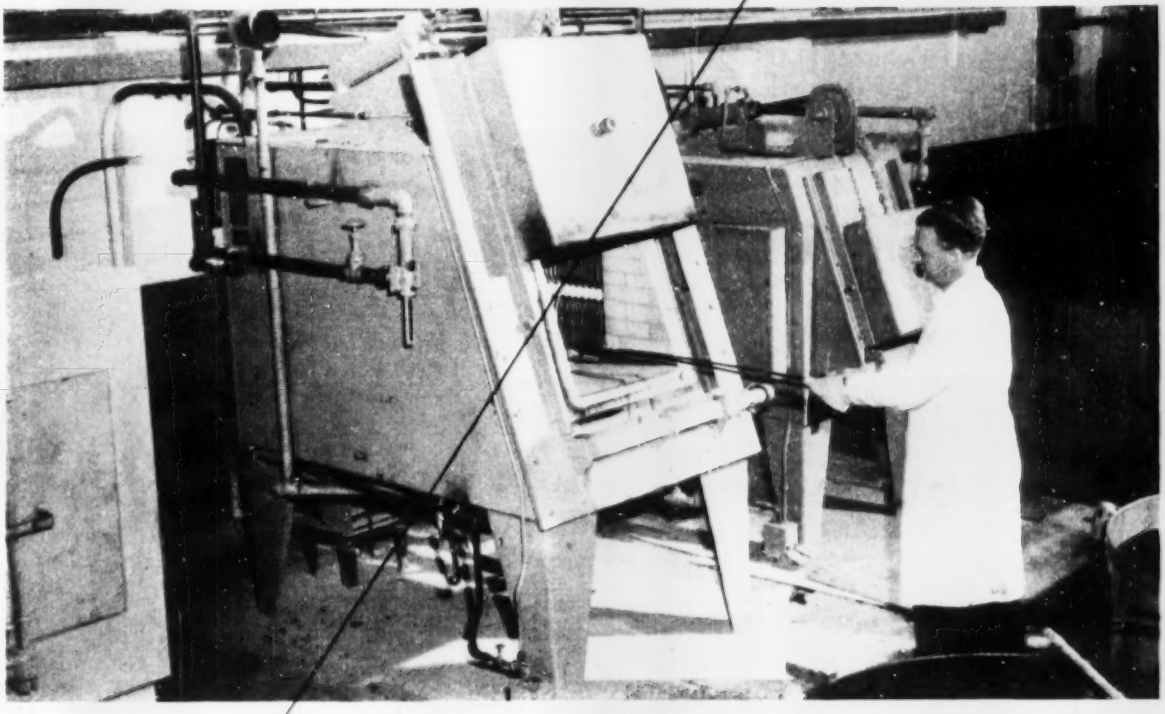
Safe transportation of unstable loads and loads subject to rough travel is gained by this attachment for the manufacturer's trucks in capacities to 6000 pounds. In addition to carrying loads safely, the stabilizer allows truck operators to stack at greater heights with maximum safety.

The only alteration required to adapt a standard truck for use with the stabilizer is alteration of the hydraulic system to regulate operation. Shape or size of the sta-

AT A. V. ROE, LTD.—in Canada

LINDBERG FURNACES

HEAT TREAT ORENDA TURBOJET ENGINE PARTS



In Canada, too . . . when production depends on precise heat treating, production men depend on Lindberg Furnaces

Proof of this is the fact that A. V. Roe (Canada) Ltd., in their new multi-million dollar aircraft plant, use Lindberg furnaces to heat treat parts for the world famous Orenda Turbojet engines.

Lindberg toolroom pre-heat and high speed Hydryzing furnaces... plus a toolroom Cyclone tempering furnace harden and temper stub shafts for the Orenda engine.

And a large box type production Hydryzer heat treats ten-stage rotor discs.

Lindberg Furnaces can solve your heat treating problem, too, from the touchiest tool and die job . . . to huge production jobs involving the hardening or tempering of tons of work daily. For descriptive literature contact your nearest Lindberg office.

Bulletin 96hs covers the type of furnaces used in the A. V. Roe plant

LINDBERG FURNACES

Lindberg Engineering Company, 2441 West Hubbard Street, Chicago 12, Illinois

MILE
AFTER
MILE...
WALLINGFORD
Close Tolerance
STAINLESS
STRIP

gives you...
MORE PRODUCTION
BETTER PRODUCTS
LONGER DIE LIFE
FEWER REJECTS
LESS DOWN-TIME
CONSTANT QUALITY

because...
WALLINGFORD
STRIP *is Uniform*

LOW CARBON
HIGH CARBON
STAINLESS
STRIP and TUBING

THE
WALLINGFORD
SINCE 1922
STEEL
CO
WALLINGFORD, CONN. U.S.A.

NEW PRODUCTS and equipment

bilizer plate can be altered to meet specific loads. The unit is powered by a hydraulic cylinder with a pair of telescoping guides to insure

smooth operation and rigidity. The clamping pressure can be varied within 150 to 1350 psi limits. Elwell-Parker Electric Co., Dept. ST, 4205 St. Clair Ave., Cleveland 3, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 14

Steel Date Stamps

. . . mark tools and assemblies

These steel date stamps mark tools, assemblies, any product or material clearly, indelibly with date of manufacture. Sets consist of 12 individual stamps each bearing a key letter that changes annually and a number to indicate the month. Sets are available in 1/16, 1/8 and 3/16-inch character sizes. Parker Stamp Works Inc., Dept. ST, 650 Franklin Ave., Hartford, Conn.

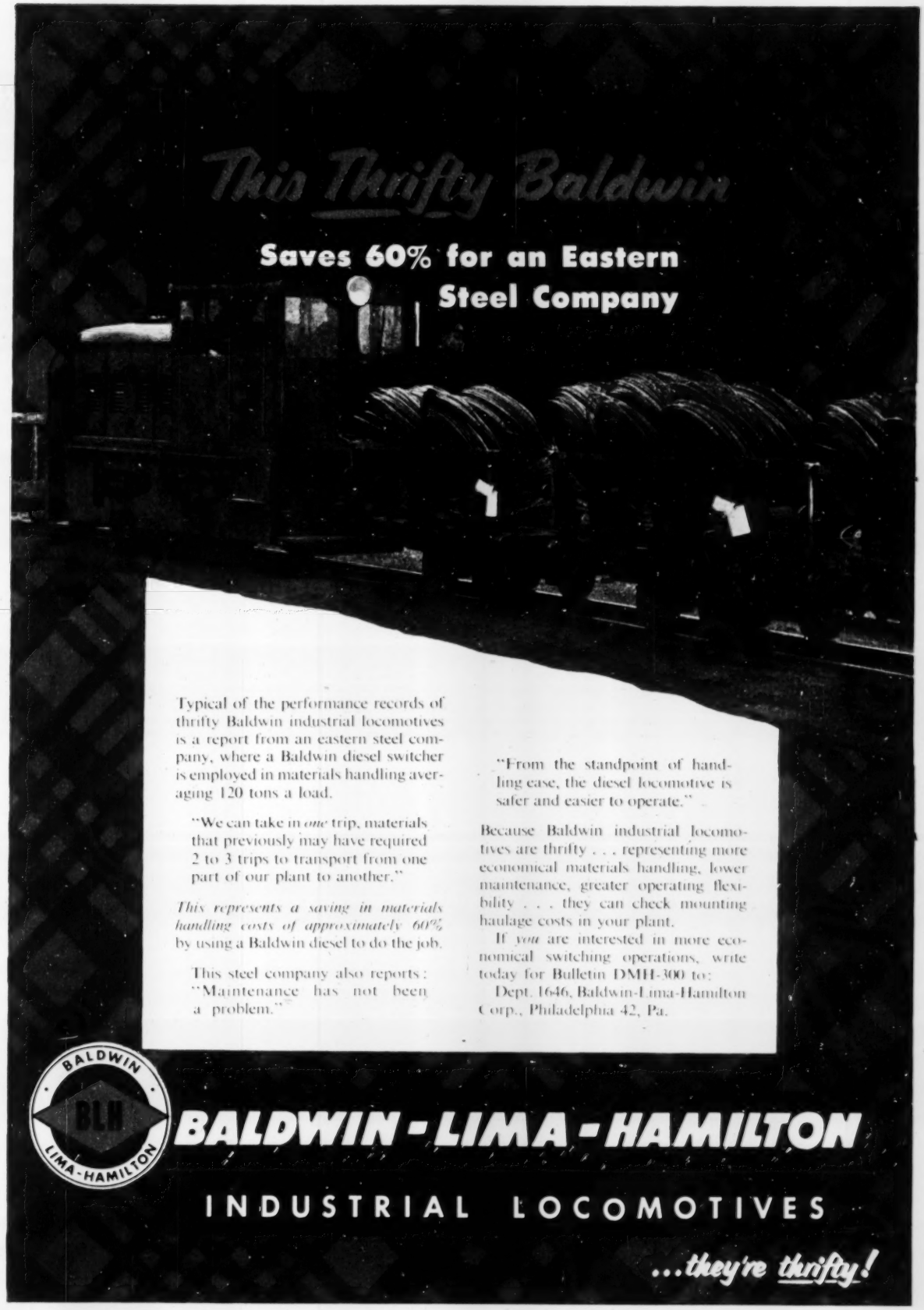
FOR MORE DATA—CIRCLE REPLY CARD NO. 15

Pneumatic Transmitter

. . . pressures: 5 to 15 psi

This miniature pneumatic transmitter measures and transmits readings of temperature, pressure, vacuum and liquid level to recording, indicating and controlling receivers. Transmission is accomplished by air pressures between 3 and 15 psi that have direct relation to measured quantity.

The transmitter uses a simple



Typical of the performance records of thrifty Baldwin industrial locomotives is a report from an eastern steel company, where a Baldwin diesel switcher is employed in materials handling averaging 120 tons a load.

"We can take in *one* trip, materials that previously may have required 2 to 3 trips to transport from one part of our plant to another."

This represents a saving in materials handling costs of approximately 60% by using a Baldwin diesel to do the job.

This steel company also reports: "Maintenance has not been a problem."

"From the standpoint of handling ease, the diesel locomotive is safer and easier to operate."

Because Baldwin industrial locomotives are thrifty . . . representing more economical materials handling, lower maintenance, greater operating flexibility . . . they can check mounting haulage costs in your plant.

If *you* are interested in more economical switching operations, write today for Bulletin DMH-300 to:

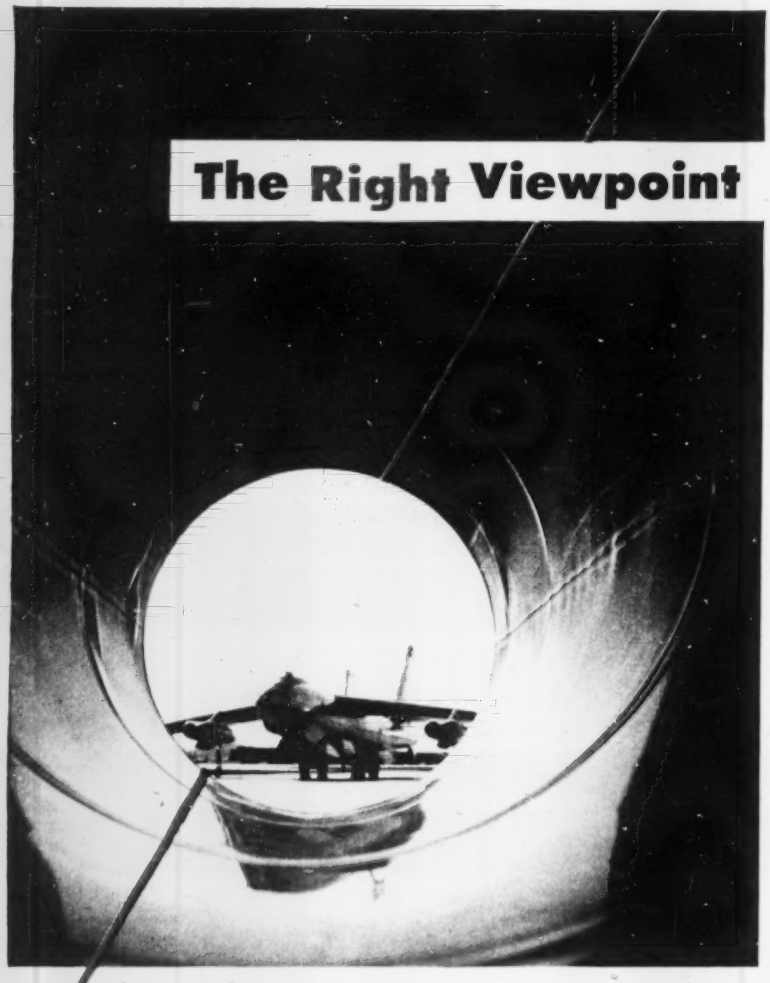
Dept. 1646, Baldwin-Lima-Hamilton Corp., Philadelphia 42, Pa.

BALDWIN · BLH · LIMA-HAMILTON

BALDWIN-LIMA-HAMILTON

INDUSTRIAL LOCOMOTIVES

...they're thrifty!



When you're thinking about aluminum or magnesium castings, you need the services of an organization with the right viewpoint.

We're referring, of course, to the right viewpoint toward the best possible use of these two light metals . . . ability to do the job; . . . service; . . . adequate facilities for production; . . . experience.

We here at Wellman like to think we have a combination of all these things . . . trained, interested personnel, three complete foundries and a modern pattern shop, almost a half century of experience in solving casting problems.

Why don't you try us and see how we look from your viewpoint?

- Well-Cast Aluminum and Magnesium Castings
- Well-Made wood and metal patterns

THE WELLMAN BRONZE & ALUMINUM CO.

Visit us at the National Magnesium Exposition, Washington, D. C., starting March 31st

DEPT. 19, 12800 SHAKER BLVD., CLEVELAND 20, OHIO

NEW PRODUCTS and equipment

transmitting mechanism with only one pivot and no flexures. The unit is sensitive to extremely small changes in measured value as little as 0.03 per cent of range including reversal. Series 650 weighs 7½ pounds, is weatherproof and will operate in any position. Bristol Co., Dept. ST, Waterbury 20, Conn.

FOR MORE DATA—CIRCLE REPLY CARD NO. 16

Plastic Labeling Tape

. . . sticks without moistening

Problems caused by soiled labels and labels that fall off are bypassed by a plastic labeling tape called Labelon. The tape is pressure-sensitive, sticks without moistening to any smooth, dry and reasonably clean surface. Identification can be made on the tape without ink, pencil, or crayon. A sharp point is the only requisite.

Pressure of the writing instrument alone causes the inscription to appear beneath a protective outer coat of transparent plastic. In actual practice, these instruments range from pencils to shingle nails. The outer coat protects against smudging, water and most chemicals. Labels will not curl, discolor or lose adhesive quality due to age. Labelon Tape Co. Inc., Dept. ST, 450 Atlantic Ave., Rochester 9, N. Y.

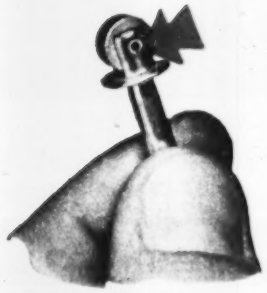
FOR MORE DATA—CIRCLE REPLY CARD NO. 17

High-Velocity Roof Ventilator

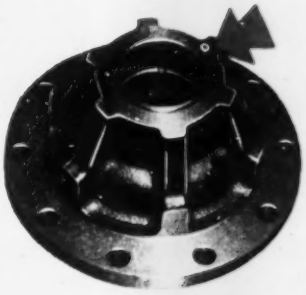
. . . exhaust or fresh air uses

This weather-tight high velocity roof ventilator is specially adapted for windowless plant construction. Primarily employed as an exhaust fan, it can be used also to provide fresh air supply.

Automatic built-in louvers act as

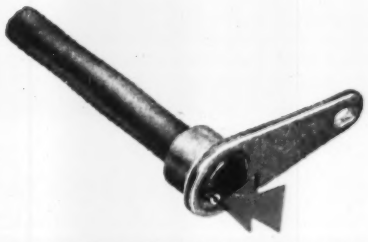


AS A SHAFT . . . Rollpin serves as an axle for the sparkwheel of a cigarette lighter. No riveting or threading necessary . . . faster assembly. Note flush, clean fit.

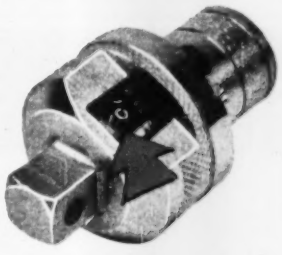


AS A DOWEL . . . Rollpin is used here to prevent rotation of a thrust bearing. No reaming, no special locking. Easily removed. Lowest possible dowel pin cost.

AS A CLEVIS PIN . . . here Rollpin holds firmly in clevis, permits free action of moving member. Rollpin application above is with the plate of a home workshop tool.



AS A KEY . . . Rollpin demonstrates its ability to do away with precision tolerances, in this heating system damper arm. Faster, cheaper and more satisfactory than usual assemblies.



AS A STOP PIN . . . in this application, Rollpin is shown in a ratchet wrench adaptor. With its light weight and high shear strength, Rollpin functions perfectly . . . cuts assembly costs.

AS A SIMPLE FASTENER . . . Rollpin replaces a set screw in pinning a gear to a shaft. Assembly time is shorter, service life longer. Vibration-proof flush fit. Easily removable.

YOUR IMPORTANT FASTENING JOBS

are cheaper . . . faster, with ROLLPIN TRADE MARK

Rollpin is a pressed-fit pin with chamfered ends. It drives easily into holes drilled to normal tolerances, compressing as driven. No reaming, no tapering, no extra assembly steps required. Rollpin fits flush, *locked* in place by the constant pressure it exerts against the hole walls. Can be inserted with automatic press, or by hand—removable with a drift or pin punch.

Rollpin is reusable again and again.

Elastic Stop Nuts with the famous red collar are another ESNA product

ESNA

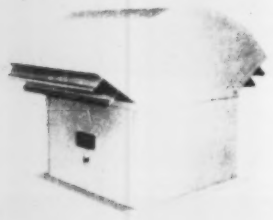
MAIL COUPON TODAY. If your present operations or plans include the above applications—or set screws, rivets, hinge pins, cotter pins, pivot pins, taper pins—you can't afford to be without complete details on Rollpin. Write now—find out how much faster and cheaper Rollpin can do the job.

Section RI-360, Elastic Stop Nut Corporation of America
2330 Vauxhall Road, Union, N. J.
Please send me the following free information on ESNA self-locking fasteners:

☐ Rollpin bulletin and sample Rollpins ☐ AN ESNA conversion chart
☐ Elastic Stop Nut Bulletin ☐ Here is a drawing of our product. What fastener do you recommend?

Name Title
Firm
Street
City Zone State

effective back draft damper. If necessary, louvers can be installed at the base. Hood can be removed for easy inspection. Fans are



available in direct and belt drive. Ball bearing motors are totally enclosed or explosion proof. Chelsea Fan & Blower Co. Inc., Dept. ST, 639 South Ave., Plainfield, N. J.

FOR MORE DATA—CIRCLE REPLY CARD NO. 18

Radial Bearings

. . . are solid race type

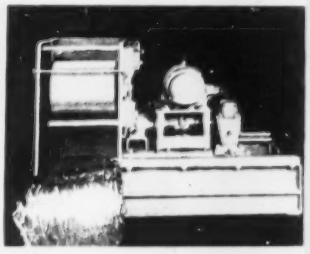
Precision ground radial bearings in the C series are of the solid race type with ball retainers. They are made in inch dimensions which correspond to established light duty inch standard sizes. They are designed for light duty radial thrust or combined load applications and speeds ranging to 5000 rpm maximum. Nice Ball Bearing Co., Dept. ST, Philadelphia, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 19

Self-Contained Scrap Baller

. . . handles stringy scrap, wire

Scrap baller is designed for handling stringy scrap and wire, forming a compact scrap cylinder



22 inches long by 28 inches diameter. Weight of the ball varies from 200 to 700 pounds, depending on type of material processed.

Machine can be used for handling steel, aluminum, brass, copper and lead scrap. It was developed specifically to operate in conjunction with a slitting line, but can be used wherever stringy scrap must be handled. Phillips Mine & Mill Supply Co., Dept. ST, 2309 Jane St., Pittsburgh 3, Pa.

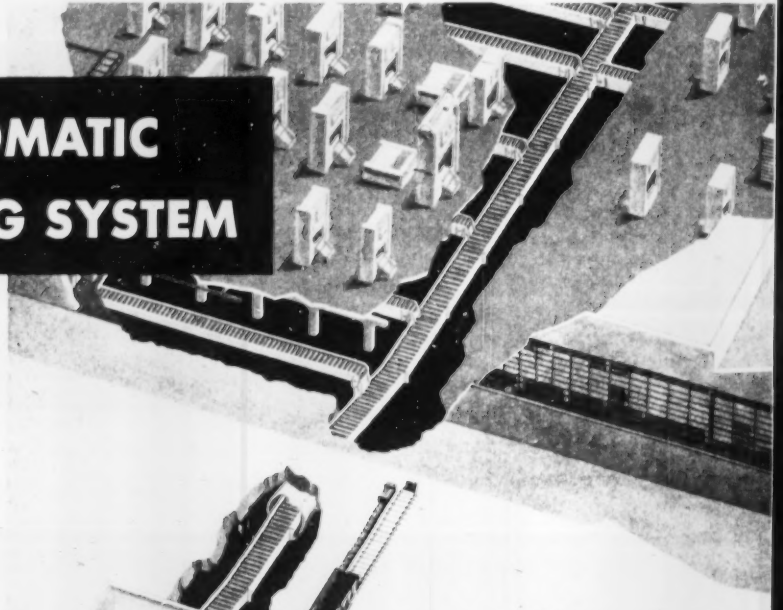
FOR MORE DATA—CIRCLE REPLY CARD NO. 20

Adjustable Spacing Collars

. . . take 20-ton arbor pressure

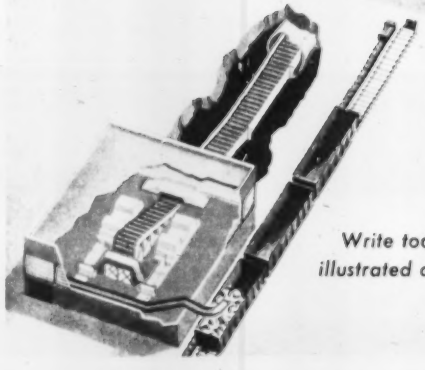
Steel alloy is introduced in these micrometer adjustable spacing collars for milling machine cutter arbors. The alloy provides greater accuracy on the micrometer screw threads and makes it possible for the operator to clamp or tighten the milling machine nut arbor up to a given pressure of 20 tons. This can be done without disturbing the micrometer accuracy of the cutting arbor adjustable spacers

MAY-FRAN AUTOMATIC SCRAP HANDLING SYSTEM



Solves scrap disposal problem for large automotive manufacturer

World's largest automatic scrap handling system engineered by **MAY-FRAN** can handle one million pounds of scrap per day . . . one man controls all operations! Twenty conveyors collect scrap from presses . . . transfer it to the 1145-foot main conveyors . . . then scrap is conveyed to baler house where it is compressed into bales and discharged into automatically indexed freight cars on siding. Entire system is operated from a single control station.



Write today for illustrated catalog.

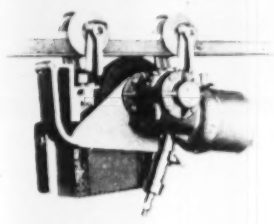
used in gang milling and other such milling machine operations. Dayton Rogers Mfg. Co., Dept. ST, Minneapolis 7, Minn.

FOR MORE DATA—CIRCLE REPLY CARD NO 21

One-Ton Monorail Tractor

. . . right-angle motor drive

For propelling ordinary electric hoist loads on standard MonoRail track, not exceeding 1-ton capacity, this tractor unit offers advantages



of direct, right-angle motor drive through a $2\frac{1}{2}$ x 8-inch rubber wheel. Drive wheel is adjustably spring loaded against the track bottom and the fabricated mounting frame permits easy access for replacement by means of hinged construction.

Called the MonoTractor, the unit is produced with standard specifications covering pushbutton control for either the drive unit alone or combined with electric hoist operation. American MonoRail Co., Dept. ST, Athens Ave., Cleveland 7, O.

FOR MORE DATA—CIRCLE REPLY CARD NO 22

Air Control Valves

. . . two built-in speed controls

Expanded air control valve line features a unit with two speed controls built into the valve body. Principal use is to control the stroke of an air cylinder. Design makes it unnecessary to install separate speed controls and simplifies piping as compared with that usually required where separate control units are necessary.

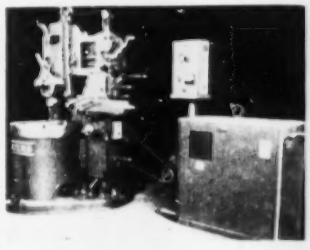
The model is available in a standard four-way piped exhaust type in $\frac{3}{8}$-inch pipe size. Valvair Corp., Dept. ST, Morgan & Beardsley Aves., Akron 11, O.

FOR MORE DATA—CIRCLE REPLY CARD NO 23

Adjustable Speed Mill Drive

. . . chuck speeds to 212 rpm

Adjustable speed drive applied to the company's model 36 vertical turret mill provides unlimited table chuck speeds up to 212 rpm. The



power unit governs motor speed and eliminates the eight-speed transmission, clutch, brake and lever controls on the standard model mill.

Independent speed control box can be located in the most conven-

Plant-wide system or Single unit
Whether you need a complete plant-wide system or a single scrap handling unit, MAY-FRAN can meet your requirements. Conveyors of any size can be supplied using the unique MAY-FRAN hinged-steel belting. Speed-up production . . . eliminate manual handling . . . reduce scrap handling costs with a MAY-FRAN system!
MAY-FRAN
ENGINEERING, INCORPORATED
1725 CLARKSTONE ROAD • CLEVELAND 12, OHIO

COLD ROLLED STRIP

TAILOR-MADE FOR YOU BY FOLLANSBEE

Follansbee is a flexible, compact organization of steel *specialists*. That's why it is one of the companies best able to offer special, personalized attention to the needs of Cold Rolled Strip buyers.

Follansbee Cold Rolled Strip is rolled and tempered to your specifications—a custom-made quality strip that fulfills most manufacturing needs.

Follansbee Custom Quality and Custom Service means *real* production efficiency and time-saving economy in your forming operations.

Assure yourself a continuous supply of uniform strip from coils, delivered directly from the Follansbee mills to your automatics. A trained Follansbee Steel representative is as near as your telephone. Call him today. He'll gladly discuss your strip steel fabricating requirements with you.

FOLLANSBEE STEEL CORPORATION

GENERAL OFFICES, PITTSBURGH 30, PA.

COLD ROLLED STRIP SEAMLESS TERNE ROLL ROOFING
POLISHED BLUE SHEETS AND COILS

Sales Offices—Chicago, Cleveland, Detroit, Indianapolis, Kansas City, Los Angeles, Milwaukee, Nashville, New York, Philadelphia, Rochester, San Francisco, Seattle; Toronto and Montreal, Canada.
Mills—Follansbee, W. Va.

FOLLANSBEE METAL WAREHOUSES
Pittsburgh, Pa. Rochester, N.Y. Fairfield, Conn.

NEW PRODUCTS and equipment

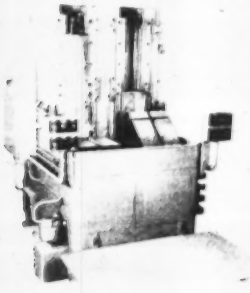
ient spot for the worker. This box is equipped with rheostat control, has start, stop jog pushbuttons. It sets and changes motor speeds and provides a ratio of more than 16 to 1. Speeds can be changed while the machine is in operation. Rogers Machine Works Inc., Dept. ST, Alfred, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 24

Surface Broaching Machine

. . . dual ram line expanded

Addition to the manufacturer's standard broaching machine line provides a 30-inch stroke, 4-ton capacity dual ram size. Relatively short stroke and light tonnage of this machine is designed for work



on small parts at high production rate. Tilting work table provides convenient loading positions for parts. The machine can be set at either automatic or semiautomatic cycle. American Broach & Machine Co., Dept. ST, Ann Arbor, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 25

Portable Cart

. . . with 5 cu ft capacity

Rol-A-Way cart can receive ashes direct from the average 20-inch high grate line. The handle folds down for easy access to the fire door. Cart has a capacity over

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69. Double Angle Shears

Kling Bros. Engineering Works—Details of a machine which combines two shears in single unit are contained in 4-page illustrated bulletin 2345. This double angle shear is designed for fast production on long and short runs in cutting flats, bars and angles.

70. Measuring Coatings

Branson Instruments, Inc.—The model 660 Coatingage, a portable instrument used to measure thickness of nonmagnetic coatings on magnetic bases and to detect pin-holes in nonconductive coatings on conductive bases, is subject of 6-page folder. Detailed operating instructions are included.

71. Swing Check Valves

Vernon Tool Co., Brown Valve Div.—Descriptive as well as dimensional and weight data relative to cast steel swing check valves are contained in 4-page illustrated folder. Valves are made in pipe sizes from 2 to 8 in.

72. Metal Washing

Metalwash Machinery Corp.—Volume 1, No. 2 of the "Metalwash Finishing Engineer" features "The Farmr Story" which show the meticulous schedule of washing and inspection followed to make Farmr ball bearings. Techniques and equipment for washing aluminum military component are covered as well.

73. Cable Conveyor Systems

Cable-Link Corp.—What the Cable-Link cable conveyor system is, how it works, what it can do and what its components look like can be found in the 6-page folder. Details of parts and some applications are shown.

74. V-Belt Drives & Sheaves

Pyott Foundry & Machine Co.—Containing revised data, 56-page catalog and reference book V-1000 provides all the necessary information required for specifying Pyott drives. Vee-Tex belts and sheaves. Drives from 1 to 1000 hp are specified and drive and belt center ratios, sheave dimensions and belt speeds are completely tabulated.

75. Shell Molding Shot

Metals Disintegrating Co., Harrison Abrasive Div.—The use of metal shot as a weighting or back-up material, particularly in shell molding, is discussed in 4-page technical bulletin No. 5. Drawings and diagrams illustrate mold box cross-section, and chart tabulates pressures exerted by various back-up materials.

76. Tool Holder & Indexing Tool

Ken-Wyn Corp.—Here are two 2-page illustrated data sheets on the Zenith tool holder and the Infindex all-purpose rotary indexing tool. Former allows tool bits to be adjusted to any angle. Arrangements for various operations are shown. Other bulletin shows uses of tool on mills, grinders, lathes and drill presses.

77. Taps

Besly-Welles Corp.—112-page illustrated catalog No. 58 and accompanying net price list is descriptive of practically every known type and size of tap, including the unified British-American tools. Completely indexed, this reference volume is a "must" for all concerned with selection and application of tapping tools.

78. Abrasive Disk Guide

Gardner Machine Co.—60-page "Guidebook for Better Surface Grinding Results" includes in its contents abrasive fundamentals, selection information, types of abrasive disks available, standard markings, spindle speeds, coolant selection, dressing, safety, grinding various materials and care of disks. It has numerous pictures and is pocket size.

3-23-53

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7	17	27	37	47	57	67	77	87
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79. Low Hydrogen Electrodes

Harnischfeger Corp. "Weld 'difficult' steels easily with little or no preheat" it says in 1-page illustrated bulletin S-26 on P & H low hydrogen electrodes. Chemical analysis, physical properties, applications and other data are covered.

80. Hydraulic Bulldozers

Williams-White & Co. Ample power for bending, forming, forging and shaping beams, bars and plates is afforded in line of hydraulic bulldozers described in 8-page illustrated bulletin 72. Capacities range from 50 to 500 tons in standard machines. Also covered are ring benders, rail benders, straighteners and special bulldozers.

81. Indirect Heaters

Black, Sivalls & Bryson, Inc. 16-page illustrated catalog C-101 deals with oil and gas-fired indirect-heaters for space and industrial heating requirements which involve heating of air, gas or liquids. Details of the series 70 heaters for salt bath operation are given also.

82. Corrosion Resistant Steel

Bethlehem Steel Co. Mayari R low alloy steel for applications requiring light weight, high strength and corrosion resistance is described thoroughly in 56-page illustrated catalog 259. Properties, chemical composition, available shapes and sizes and other data are tabualted to aid in selection and applying this versatile material.

83. Spintesting Units

Warren Brothers Roads Co., Mfg. Div. Vacuum high speed testing unit for testing rotating parts at speeds up to and even exceeding 100,000 rpm is subject of descriptive 4-page bulletin. Parts most commonly spintested are fan impellers, turbine rotors, compressor rotors, accessory turbines and gyros.

84. Production Dies

B. Jahn Mfg. Co. "The Story of B. Jahn Production Proved Dies" is brochure which illustrates dies being "production proved" by running up to 50,000 parts for production line use before die is shipped. Problems overcome are shown and company's manufacturing facilities are described.

85. Nondestructive Inspection

Magnaflux Corp. "Seeing Isn't Always Believing . . . It Depends on What is Seen!" is intriguing title of 12-page illustrated brochure on various inspection processes. Described and illustrated are Magnaflux and Magnaglo for inspection of magnetic materials, Zyglo for nonmagnetic materials, Statiflux for nonconductors, Partex for ceramics, Sonizon sound-type thickness measurement and Stresscoat for stress analysis.

86. Metal-Cutting Saws

Motch & Merryweather Machinery Co. Production cut-off saws which cut practically any size and shape of metal stock ranging from magnesium to titanium are subject of 1-page illustrated bulletin SC55. These circular sawing machines utilize the Triple-Chip principle which assures efficiency in cut-off, slitting and slotting saw blades.

EDITORIAL REPRINTS:

87. New Stainless

A significant development of the Korean war is chromium-manganese austenitic stainless containing only 1 per cent nickel. It has the strength and fabricating properties of type 301. Dr. A. G. Gray, Technical Editor, describes this metal as it is used at the Budd Co. in STEEL reprint "New Stainless Stretches Nickel."

88. Machine Modification

In STEEL reprint entitled "Modifications Speed Short-Run Operations" D. G. McConnell and R. C. Beaver describe how standard production machines at Douglas' El Segundo plant are altered to fit peculiarities of aircraft manufacture. Plant's engineering department gets the job and the credit.

89. 2-High Reversing Mills

Modern small 2-high reversing mills for rolling semifinished specialty steel products are becoming increasingly popular. Lower production costs and greater operating flexibility are principal reasons. E. C. Peterson tells the story in STEEL reprint "Small 2-High Reversing Mills Gain Favor."

90. Engine-Driven Products

"Production Is Heavy on Lightweight Engines" at title of STEEL reprint by Norman Lynn which describes the highly integrated operation carried on at McCulloch Motors Corp. Specially built machines turn out complicated parts in volume. The techniques of specialization and integration of machine tools are revealed

1	11	21	31	41	51	61	71	81
2	12	22	32	42	52	62	72	82
3	13	23	33	43	53	63	73	83
4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
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NEW PRODUCTS and equipment

5 cu ft. It can also be used as a general purpose carry all cart, parts container, etc. American Coal Burner Co., Dept. ST, 18-V E. Erie St., Chicago 11, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 26

Intraplant Package Handler

. . . open wall eases loading

Package handling truck can simplify intraplant and interdepartmental transfer. The truck has an open front wall for loading and unloading ease. Removable wood

floor slopes downward toward the back to hold items securely.

Among models made as standard, inside dimensions range from 27 x 53 inches to 36 x 60 inches; outside dimensions, from 29 x 54 to 38 x 61 inches. Height above casters on all models is 60 inches. Leebaw Mfg. Co., Dept. ST, 65 Wayne St., Youngstown 2, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 27

Armored Pipe

. . . for high temperatures

Plastaloy armored Ampcolite pipe permits the use of thermoplastic pipe at higher temperatures and pressures than is normally considered safe. Pipe is available in sizes up to 6 inches OD. Armoring can be done by the manufacturer or pipes may be armored after installation. Atlas Mineral Products Co., Dept. ST, Mertztown, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 28

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STALWART RUBBER COMPANY

200 Northfield Road • Bedford, Ohio

The Market Outlook

WATCH the automobile industry for the clue as to when steel will become plentiful.

That industry is flexing every muscle to obtain enough steel for the ambitious production goal of 3-million-plus cars in the first half of this year. While most other steel consumers, too, are pressing hard for material, the auto industry's attitude is particularly significant because it is the largest consumer of steel and any change in its procurement efforts stands out unmistakably.

COMBING THE MARKET—In trying to reach its production goal, the auto industry is using steel from every possible source: Regular supplies from mills, conversion steel, warehouse steel, foreign steel and distress stocks.

While business analysts are wondering whether the auto industry will be able to sell all the cars it hopes to make in the first half, the auto company steel buyers are beginning to say their wants in the third quarter will exceed those of the second.

SOMETHING TO WATCH—Although retail deliveries of autos have been at a fast pace, dealers' stocks of new cars on Feb. 20 (latest date of a nationwide count) totaled 374,201, highest level since Nov. 30, 1951, when the total was 375,104.

The automotive industry's heavy demand for steel has tightened up some products, such as wire, which earlier showed signs of slackening off. In particularly strong demand are cold-rolled carbon steel sheets, a major need of the automobile industry. Also adding to pressure of demand for cold-rolled sheets is the appliance industry, which, too, is experiencing good business.

CONTRASTS—Not on every front, however, is the demand strong for steel. Railroads indicate they will need very little volume of plates, bolts and spikes this year. Supplies of them ordered last year are still on hand because deliveries of rails were delayed in 1952 by the steelworkers' strike. In fact, railroad spikes are readily available.

Demand for structural steel is tapering somewhat. One reason is the completion of many defense building programs. Backlogs of some mills rolling steel reinforcing bars have been shrinking while budget decisions on public projects are awaited from Washington. In other areas, the arrival of spring construction work, including superhighways, is strengthening demand for reinforcing bars.

CHANGE OF PACE—While wide and thick steel plate is still among the products in tightest supply, the demand for it has subsided in some quarters. Shops fabricating narrow and thinner gages of plate are getting more material than they were. Shops making storage tanks have increased inventory and in at least one case in New England welded underground tanks, 1000 to 3000 gallon range, for stock shipment are being stacked for the first time in several years.

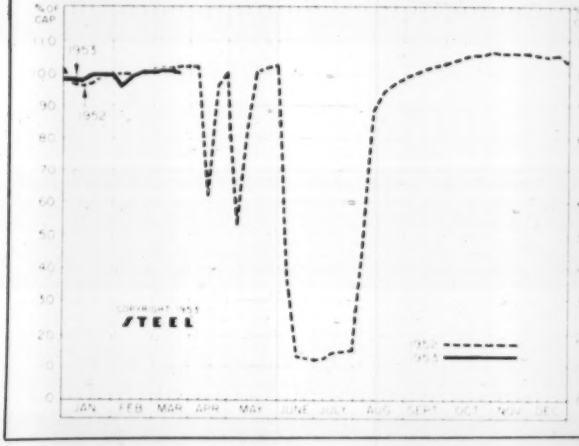
PRICES CUT—Although demand for galvanized steel sheets is lagging less than it was, jobbers in the Philadelphia area reduced their prices on that product, not only because of the drop in prices of zinc used for galvanizing the sheets, but also because of keen competitive conditions.

For the first time in more than two years, steel is free from government controls on prices. It is not expected, however, that the steel industry will take advantage of its reacquired freedom to make a general increase in prices. Undoubtedly there will be adjustments, some upward and some downward, to bring steel prices back into line with realities of production costs and competitive aspects.

HOLDING THE LINE—In making its semiannual price policy announcement on tin mill products, U. S. Steel Corp. said tin plate and other tin mill products will not be raised in price during the period of from Apr. 1 to Sept. 30.

Reflecting minor fluctuations in production in the various steelmaking districts, the rate of output of steel for ingots and castings in the week ended Mar. 21 edged down half a point from the preceding week to 100.5 per cent of capacity.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged at leading production points)

	Week Ended Mar. 21	Change	Same Week 1952	Same Week 1951
Pittsburgh	106.5	-.5	103	91
Chicago	103†	2*	106.5	107
Mid-Atlantic	97	0	98.0	100.5
Youngstown	106	0	103	106
Wheeling	100†	-.5	99.5	97
Cleveland	101†	-1*	98	103.5
Buffalo	106.5	0	104	104
Birmingham	98	0	102	100
New England	88†	1	85	90
Cincinnati	102†	-.5	98	101
St. Louis	88	-1	84	97
Detroit	106	1	104	101.5
Western	106.5	6.5	101	102
Estimated National rate	100.5	-.5	102	100.5

*Change from preceding week's revised rate.
†Estimated rates are based on Jan. 1, 1953 capacities; others on Jan. 1, 1952 capacities.
Weekly steelmaking capacity is estimated at 2,264,070 net tons in 1953, 2,077,080 tons in 1952, 1,990,614 tons in 1951.

The Metalworking Outlook—p. 39 Production Engineering News—p. 75

Composite Market Averages

FINISHED STEEL PRICE INDEX: Bureau of Labor Statistics	Mar. 17 1953	Mar. 10 1953	Month Ago	February Average
(1947-1949=100)	130.7	130.7	130.5	130.5

AVERAGE PRICES (BUREAU OF LABOR STATISTICS)
Week Ended Mar. 17, 1953

Units are 100 lb except where otherwise noted below in parentheses. For complete description of products see item following p. 28, STEEL, Sept. 8, 1952.

Rails	$3.775	Sheets, C.R. carbon	$5.275
Track spikes	6.650	Sheets, galv.	6.765
Track bolts	9.958	Strip, C.R. carbon	5.100
Tie plates	4.775	Strip, C.R. stainless (lb)	0.333
Joint bars	4.925	Pipe, black, buttweld (100 ft)	7.090
Plates, carbon	4.150	Pipe, galv., buttweld (100 ft)	8.778
Structural shapes	4.200	Boiler tubes (100 ft)	31.663
Bars, tool steel (lb)	1.575	Tin plate (100 lb base box)	8.950
Bars, 3120 alloy	6.685	Terne plate (100 lb base box)	7.750
Bars, stainless (lb)	0.153	Wire, carbon, merchant	6.075
Bars, carbon	4.100	Wire, fence, galv.	6.425
Bars, reinforcing	4.050	Nails (100 lb kegs)	7.410
Bars, C.F. carbon	5.925	Wire, barbed (80 rod spools)	5.850
Sheets, H.R. carbon	4.125	Woven wire fence (20 rod rolls)	13.625

FINISHED PRICE INDEX, Weighted Calculated by STEEL*	Mar. 19 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av. = 100)	181.31	181.31	181.31	171.92	135.91
Index in cents per lb	4.912	4.912	4.912	4.657	3.682

ARITHMETICAL PRICE COMPOSITES Calculated by STEEL*					
Finished Steel, NT	$110.98	$110.98	$110.98	$106.32	$81.14
No. 2 Fdry. Pig Iron, T	61.04	61.04	61.04	52.54	39.78
Basic Pig Iron, GT	61.66	61.66	61.66	52.16	39.21
Malleable Pig Iron, GT	66.77	66.77	66.77	63.27	49.41
Steelmaking Scrap, GT	44.17	43.17	43.00	43.00	40.25

* For explanation of weighted index see STEEL, Sept. 19, 1949, p. 64; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS	Mar. 19 1953	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Bars, H.R., Pittsburgh	3.95	3.95	3.95	3.70	2.90
Bars, H.R., Chicago	3.95	3.95	3.95	3.70	2.90
Bars, H.R., del Philadelphia	4.502	4.502	4.502	4.223	3.356
Bars, C.F., Pittsburgh	4.925	4.925	4.925	4.65	3.55
Shapes, Std., Pittsburgh	3.85	3.85	3.85	3.65	2.80
Shapes, Std., Chicago	3.85	3.85	3.85	3.65	2.80
Shapes, del. Philadelphia	4.13	4.13	4.13	3.918	2.968
Plates, Pittsburgh	3.90	3.90	3.90	3.70	2.95
Plates, Chicago	3.90	3.90	3.90	3.70	2.95
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.15	3.45
Plates, Sparrows Point, Md.	3.90	3.90	3.90	3.70	2.95
Plates, Claymont, Del.	4.35	4.35	4.35	4.15	3.65
Sheets, H.R., Pittsburgh	3.775	3.775	3.775	3.60-75	2.80
Sheets, H.R., Chicago	3.775	3.775	3.775	3.60	2.80
Sheets, C.R., Pittsburgh	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Chicago	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Detroit	4.775	4.775	4.775	4.55	3.71
Sheets, Galv., Pittsburgh	5.075	5.075	5.075	4.80	3.95
Strip, H.R., Pitts.	3.975-4.225	3.975-4.225	3.975-4.225	3.75-4.00	3.05
Strip, H., Chicago	3.725	3.725	3.725	3.50	2.80
Strip, C.R., Pittsburgh	5.10-5.50	5.10-5.50	5.10-5.50	4.65-5.35	3.80
Strip, C.R., Chicago	5.55	5.55	5.55	4.90	3.65
Strip, C.R., Detroit	5.30-6.05	5.30-6.05	5.30-6.05	4.85-5.60	3.71
Wire, Basic, Pitts.	5.475-5.225	5.475-5.225	5.475-5.225	4.85-5.10	3.775
Nails, Wire, Pittsburgh	6.35	6.35	6.35	5.90-6.20	5.20
Tin plate box, Pittsburgh	$8.95	$8.95	$8.95	$8.70	$6.70

SEMIFINISHED					
Billets, forging, Pitts. (NT)	$70.50	$70.50	$70.50	$66.00	$54.00
Wire rods, ⅜"-⅝", Pitt	4.425	4.425	4.425	4.10-30	3.175

PIG IRON, Gross Ton					
Bessemer, Pitts.	$55.50	$55.50	$55.50	$53.00	$40.996
Basic, Valley	54.50	54.50	54.50	52.00	39.00
Basic, del. Phila.	59.25	59.25	59.25	56.61	42.004
No. 2 Fdry., Pitts.	55.00	55.00	55.00	52.50	40.496
No. 2 Fdry., Chicago	55.00	55.00	55.00	52.50	39.00
No. 2 Fdry., Valley	55.00	55.00	55.00	52.50	39.50
No. 2 Fdry., del. Phila.	59.75	59.75	59.75	57.11	42.504
No. 2 Fdry., Birm.	51.38	51.38	51.38	48.88	37.88
No. 2 Fdry. (Birm.) del. Cin.	58.93	58.93	58.93	55.49	42.23
Malleable, Valley	55.00	55.00	55.00	52.50	39.50
Malleable, Chicago	55.00	55.00	55.00	52.50	39.50
Charcoal, Lyles, Tenn.	68.50	68.50	68.50	66.00	55.00
Ferromanganese, Etna, Pa.	228.00	228.00	228.00	188.00	151.00*

*F.o.b. cars, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)					
No. 1 Heavy Melt., Pitts.	$44.00	$44.00	$44.00	$44.00	$40.25
No. 1 Heavy Melt., E. Pa.	46.00	43.00	41.50	42.50	39.00
No. 1 Heavy Melt., Chicago	42.50	42.50	42.50	42.50	39.00
No. 1 Heavy Melt., Valley	44.25	44.25	44.00	44.00	40.25
No. 1 Heavy Melt., Cleve.	44.25	44.25	44.25	43.00	39.75
No. 1 Heavy Melt., Buffalo	43.50	43.50	43.00	43.00	44.00
Rails, Rerolling, Chicago	53.00	53.00	52.50	52.50	49.50
No. 1 Cast, Chicago	43.00	43.00	43.00	49.00†	66.00

†F.o.b. shipping point.

COKE, Net Ton					
Beehive, Furn., Connlsv.	$14.75	$14.75	$14.75	$14.75	$12.50
Beehive, Fdry., Connlsv.	17.00	17.00	17.00	17.50	14.875
Oven, Fdry., Chicago	24.50	24.50	24.50	23.00	19.25

PIG IRON

F.o.b. furnace prices as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$56.50	$57.00	$57.50	$58.00
NewYork, del.	....	60.78	61.28	....
Newark, del.	59.52	60.02	60.52	61.02
Philadelphia, del.	59.25	59.75	60.25	60.75
Birmingham District				
AlabamaCity,Ala. R2	50.88	51.38	....	....
Birmingham R2	50.88	51.38	....	....
Birmingham S9	....	51.38	....	....
Woodward,Ala. W15	50.88	51.38	....	....
Cincinnati, del.	....	58.93	....	....
Buffalo District				
Buffalo R2	54.50	55.00	55.50	....
Buffalo H1	54.50	55.00	55.50	....
Tonawanda,N.Y. W12	54.50	55.00	55.50	....
No.Tonawanda,N.Y. T9	....	55.00	55.50	....
Boston, del.	65.15	65.65	66.15	....
Rochester,N.Y., del.	57.92	58.92	58.52	....
Syracuse,N.Y., del.	58.62	59.12	59.62	....
Chicago District				
Chicago I-3	54.50	55.00	55.00	55.50
Gary,Ind. U5	54.50	....	55.00	....
Indiana Harbor,Ind. I-2	54.50	....	55.00	....
So.Chicago,Ill. W14	54.50	55.00	55.00	....
So.Chicago,Ill. Y1	54.50	55.00	55.00	....
So.Chicago,Ill. U5	54.50	....	55.00	55.50
Milwaukee, del.	56.67	57.17	57.17	57.67
Muskegon,Mich., del.	....	64.39	61.39	....
Cleveland District				
Cleveland A7	54.50	55.00	55.00	55.50
Cleveland R2	54.50	55.00	55.00	....
Akron,O., del. from Cleve.	57.11	57.61	57.61	58.11
Lorain, O. N2	54.50	....	....	55.50
Duluth I-3	....	....	55.00	....
Erie,Pa. I-3	54.50	55.00	55.00	55.50
Everett,Mass. E1	....	59.50	60.00	....
Fontana,Calif. K1	60.50	61.00	....	....
Granite City,Ill. G4	56.00	56.50	57.00	....
St.Louis, del. (inc. tax)	57.15	*57.65	58.15	....
Ironton,Utah C11	54.50	55.00	....	....
Geneva,Utah C11	54.50	55.00	....	....
LoneStar, Tex. L6	50.50	*51.00	51.00	....
Minnequa,Colo. C10	56.50	57.50	57.50	....
Rockwood,Tenn. T3	....	....	58.50	....
Pittsburgh District				
Neville Island,Pa. P6	....	55.00	55.00	55.50
Pitts., N.&S. sides, Aliquippa, Ambridge				
Aliquippa del.	....	56.37	56.37	56.87
McKeesRocks del.	....	56.04	56.04	56.54
Lawrenceville, Homestead				
Wilmerding, Monaca, del.	....	56.66	56.66	57.16
Verona, Trafford, del.	....	57.19	57.19	57.69
Brackenridge del.	....	57.45	57.45	57.95
Bessemer,Pa. U5	54.50	....	55.00	55.50
Clairton,Rankin,So.Duquesne,Pa. U5	54.50	....	....	....
McKeesport,Pa. N3	54.50	....	....	55.50
Monessen,Pa. P7	56.50	....	....	....
Sharpsville,Pa. S6	....	....	55.00	55.50
Steelton,Pa. B2	56.50	57.00	57.50	58.00
Swedeland,Pa. A3	58.50	59.00	59.50	60.00
Toledo,O. I-3	54.50	55.00	55.00	55.50
Cincinnati, del.	59.97	60.47	....	....
Troy,N.Y. R2	56.50	57.00	57.50	58.00
Youngstown District				
Hubbard,O. Y1	54.50	55.00	55.00	....
Youngstown Y1	54.50	55.00	55.00	....
Youngstown U5	54.50	....	....	55.50
Mansfield,O., del.	59.15	59.65	59.65	60.15

*Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton (Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)	
Jackson,O. G2, J1	$65.50
Buffalo H1	66.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton	
(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.50 each 0.5% Mn over 1%; $2 per gross ton premium for 0.04% max P)	
NiagaraFalls,N.Y. P15	$91.00
Keokuk,Iowa, Openhearth & Fdry. 9ft. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, 9ft. allowed K2	92.50
Wenatchee, Wash., OH & Fdrys., 9ft. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton (Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)	
Lyles,Tenn. T3	$68.50

LOW PHOSPHORUS PIG IRON, Gross Ton	
Cleveland, intermediate, A7	$59.50
Steelton,Pa. B2	62.50
Philadelphia, delivered	66.05
Troy,N.Y. R2	62.50

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Semifinished and Finished Steel Products

Mill prices as reported to STEEL, Mar. 19, 1953, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ... $81.00
Munhall,Pa. U5 ... 54.00
Seattle S24 ... 75.00

INGOTS, Alloy (NT)
Detroit R7 ... $57.00
Fontana,Calif. K1 ... 83.00
Houston S5 ... 65.00
Midland,Pa. C18 ... 57.00
Munhall, Pa. U5 ... 57.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ... $50.00
ClairtonPa. U5 ... 59.00
Ensley,Ala. T2 ... 59.00
Fairfield,Ala. T2 ... 59.00
Fontana,Calif. K1 ... 78.00
Gary,Ind. U5 ... 59.00
Johnstown,Pa. B2 ... 59.00
Lackawanna,N.Y. B2 ... 59.00
Munhall,Pa. U5 ... 59.00
So.Chicago,Ill. U5 ... 59.00
SoDuquesne,Pa. U5 ... 59.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ... $70.50
Buffalo R2 ... 70.50
Canton,O. R2 ... 70.50
Clairton,Pa. U5 ... 70.50
Cleveland R2 ... 70.50
Conshohocken,Pa. A3 ... 77.50
Detroit R7 ... 73.50
Ensley,Ala. T2 ... 70.50
Fairfield,Ala. T2 ... 70.50
Fontana,Calif. K1 ... 86.50
Gary,Ind. U5 ... 70.50
Geneva,Utah C11 ... 70.50
Houston S5 ... 78.50
Johnstown,Pa. B2 ... 70.50
Lackawanna,N.Y. B2 ... 70.50
LosAngeles B3 ... 86.50
Munhall,Pa. U5 ... 70.50
Seattle B3 ... 86.50
So.Chicago B2,U5,W14 ... 70.50
So.Duquesne,Pa. U5 ... 70.50
So.SanFrancisco B3 ... 86.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ... 76.00
Buffalo R2 ... 76.00
Canton,O. R2 ... 76.00
Canton,O. T7 ... 78.00
Conshohocken,Pa. A3 ... 83.00
Detroit R7 ... 79.00
Fontana,Calif. K1 ... 95.00
Gary,Ind. U5 ... 76.00
Houston S5 ... 84.00
Ind.Harbor,Ind. Y1 ... 76.00
Johnstown,Pa. B2 ... 76.00
Lackawanna,N.Y. B2 ... 76.00
LosAngeles B3 ... 96.00
Massillon,O. R2 ... 76.00
Midland,Pa. C18 ... 76.00
Munhall,Pa. U5 ... 76.00
So.Chicago B2,U5,W14 ... 76.00
So.Duquesne,Pa. U5 ... 76.00
Struthers,O. Y1 ... 76.00
Warren,O. C17 ... 76.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ... 87.50
Canton,O. R2 ... 87.50
Cleveland R2 ... 87.50
Fontana,Calif. K1 ... 108.50
Gary,Ind. U5 ... 87.50
Massillon,O. R2 ... 87.50
So.Chicago,Ill. R2 ... 87.50
So.Duquesne,Pa. U5 ... 87.50

SHEETS, BARS (NT)
Fontana,Calif. K1 ... 93.18

SKELP
Aliquippa,Pa. J5 ... 3.65
Munhall,Pa. U5 ... 3.65
Warren,O. R2 ... 3.65
Youngstown,O. R2, U5 ... 3.65

WIRE RODS
Alton,Ill. L1 ... 4.70
AlabamaCity,Ala. R2 ... 4.32
Buffalo,W.12 ... 4.32
Cleveland A7 ... 4.32
Donora,Pa. A7 ... 4.32
Fairfield,Ala. T2 ... 4.32
Fontana,Calif. K1 ... 5.12
Houston S5 ... 4.72
Johnstown,Pa. B2 ... 4.32
Joliet,Ill. A7 ... 4.32
KansasCity,Mo. S5 ... 4.66
LosAngeles B3 ... 5.12
Minnequa,Colo. C10 ... 4.57
Monessen,Pa. P7 ... 4.52
No.Tonawanda,N.Y. B11 ... 4.32
Pittsburg,Calif. C11 ... 4.75
Portsmouth,O. P12 ... 4.52
Roebling,N.J. R5 ... 4.42
So.Chicago,Ill. R2 ... 4.32
SparrowsPoint,Md. B2 ... 4.42
Sterling,Ill.(1) N15 ... 4.32
Struthers,O. Y1 ... 4.32
Torrance,Calif. C11 ... 5.12
Worcester,Mass. A7 ... 4.62

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ... 4.675
Lackawanna,N.Y. B2 ... 4.675
Munhall,Pa. U5 ... 4.675
So.Chicago,Ill. U5 ... 4.675

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ... 3.85
Aliquippa,Pa. J5 ... 3.85
Bessemer,Ala. T2 ... 3.85
Bethlehem,Pa. B2 ... 3.90
Clairton,Pa. U5 ... 3.85
Fairfield,Ala. T2 ... 3.85
Fontana,Calif. K1 ... 4.50
Gary,Ind. U5 ... 3.85
Geneva,Utah C11 ... 3.85
Houston S5 ... 4.25
Ind.Harbor,Ind. I-2 ... 3.85
Johnstown,Pa. B2 ... 3.90
KansasCity,Mo. S5 ... 4.45
Lackawanna,N.Y. B2 ... 3.90
LosAngeles B3 ... 4.45
Minnequa,Colo. C10 ... 4.30
Munhall,Pa. U5 ... 3.85
Niles,Calif.(22) P1 ... 4.56
Phoenixville,Pa. P1 ... 4.95
Seattle B3 ... 4.50
So.Chicago,Ill. U5, W14 ... 3.85
So.SanFrancisco B3 ... 4.40
Torrance,Calif. C11 ... 4.45
Weirton,W.Va. W6 ... 4.10

Wide Flange
Bethlehem,Pa. B2 ... 3.90
Clairton,Pa. U5 ... 3.85
Fontana,Calif. K1 ... 5.05
Johnstown,Pa. B2 ... 3.90
Lackawanna,N.Y. B2 ... 3.90
Munhall,Pa. U5 ... 3.85
So.Chicago,Ill. U5 ... 3.85

Alloy Stand. Shapes
Clairton,Pa. U5 ... 4.725
Fontana,Calif. K1 ... 5.925
Gary,Ind. U5 ... 4.725
Munhall,Pa. U5 ... 4.725
So.Chicago,Ill. U5 ... 4.725

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 ... 5.80
Bessemer,Ala. T2 ... 5.80
Bethlehem,Pa. B2 ... 5.80
Clairton,Pa. U5 ... 5.80
Fairfield,Ala. T2 ... 5.80
Fontana,Calif. K1 ... 6.45
Gary,Ind. U5 ... 5.80
Geneva,Utah C11 ... 5.80
Ind.Harbor,Ind. I-2 ... 5.80
Ind.Harbor,Ind. Y1 ... 6.30
Johnstown,Pa. B2 ... 5.80
Lackawanna,N.Y. B2 ... 5.80
LosAngeles B3 ... 6.35
Munhall,Pa. U5 ... 5.80
Seattle B3 ... 6.40
So.Chicago,Ill. U5 ... 5.80
So.SanFrancisco B3 ... 6.30
Struthers,O. Y1 ... 6.30

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 ... 5.80
Lackawanna,N.Y. B2 ... 5.80
Munhall,Pa. U5 ... 5.80
So.Chicago,Ill. U5 ... 5.80

BEARING PILES
Munhall,Pa. U5 ... 3.85
So.Chicago,Ill. U5 ... 3.85

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 ... 5.95
Bessemer,Ala. T2 ... 5.95
Clairton,Pa. U5 ... 5.95
Cleveland J5, R2 ... 5.95
Conshohocken,Pa. A3 ... 6.20
Ecorse,Mich. G5 ... 6.00
Fairfield,Ala. T2 ... 5.95
Fontana,Calif.(30) K1 ... 6.65
Gary,Ind. U5 ... 5.95
Geneva,Utah C11 ... 5.95
Ind.Harbor,Ind. I-2 ... 5.95
Ind.Harbor,Ind. Y1 ... 6.45
Johnstown,Pa. B2 ... 5.95
Munhall,Pa. U5 ... 5.95
Pittsburgh J5 ... 5.95
Seattle B3 ... 6.85
Sharon,Pa. S3 ... 5.95
So.Chicago,Ill. U5 ... 5.95
SparrowsPoint,Md. B2 ... 5.95
Warren,O. R2 ... 5.95
Youngstown Y1 ... 6.45
Youngstown U5 ... 5.95

PLATES, Open-Hearth Alloy
Claymont,Del. C22 ... 5.35
Coatesville,Pa. L7 ... 5.75
Conshohocken,Pa. A3 ... 5.50
Fontana,Calif. K1 ... 6.20
Gary,Ind. U5 ... 5.25
Johnstown,Pa. B2 ... 5.25
Munhall,Pa. U5 ... 5.25
Sharon,Pa. S3 ... 5.50
So.Chicago,Ill. U5 ... 5.25
SparrowsPoint,Md. B2 ... 5.25

FLOOR PLATES
Cleveland J5 ... 4.95
Conshohocken,Pa. A3 ... 4.95
Ind.Harbor,Ind. I-2 ... 4.95
Munhall,Pa. U5 ... 4.95
So.Chicago,Ill. U5 ... 4.95

PLATES, Ingot Iron
Ashland,c.l. (15) A10 ... 4.15
Cleveland,c.l. R2 ... 4.50
Warren,O.,c.l. R2 ... 4.50

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ... 3.90
Aliquippa,Pa. J5 ... 3.90
Ashland,Ky. (15) A10 ... 3.90
Bessemer,Ala. T2 ... 3.90
Clairton,Pa. U5 ... 3.90
Claymont,Del. C22 ... 4.35
Cleveland J5, R2 ... 3.90
Coatesville,Pa. L7 ... 4.35
Conshohocken,Pa. A3 ... 4.35
Ecorse,Mich. G5 ... 4.45
Fairfield,Ala. T2 ... 3.90
Fontana,Calif.(30) K1 ... 4.55
Gary,Ind. U5 ... 3.90
GraniteCity,Ill. G4 ... 4.60
Geneva,Utah C11 ... 3.90
Harrisburg,Pa. C5 ... 6.50
Houston S5 ... 4.30
Ind.Harbor,Ind. I-2, Y1 ... 3.90
Johnstown,Pa. B2 ... 3.90
Lackawanna,N.Y. B2 ... 3.90
Minnequa,Colo. C10 ... 4.20
Munhall,Pa. U5 ... 3.90
Pittsburgh J5 ... 3.90
Seattle B3 ... 4.80
Sharon,Pa. S3 ... 4.15
So.Chicago,Ill. U5, W14 ... 3.90
SparrowsPoint,Md. B2 ... 3.90
Steubenville,O. W10 ... 3.90
Warren,O. R2 ... 3.90
Weirton,W.Va. W6 ... 4.20
Youngstown R2, U5, Y1 ... 3.90

PLATES, Carbon A.R.
Fontana,Calif. K1 ... 5.70
Geneva,Utah, C11 ... 5.05

PLATES, Wrought Iron
(Add 4.7% to base and extras)
Economy,Pa. B14 ... 8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ... 3.95
Aliquippa,Pa. J5 ... 3.95
Alton,Ill. L1 ... 4.50
Atlanta,Ga. A11 ... 4.50
Bessemer,Ala. T2 ... 3.95
Buffalo R2 ... 3.95
Canton,O. R2 ... 3.95
Clairton,Pa. U5 ... 3.95
Cleveland R2 ... 3.95
Detroit R7 ... 4.10
Ecorse,Mich. G5 ... 4.30
Emeryville,Calif. J7 ... 4.70
Fairfield,Ala. T2 ... 3.95
Fontana,Calif. K1 ... 4.65
Gary,Ind. U5 ... 3.95
Houston S5 ... 4.35
Ind.Harbor,Ind. I-2, Y1 ... 3.95
Johnstown,Pa. B2 ... 3.95
KansasCity,Mo. S5 ... 4.55
Lackawanna,N.Y. B2 ... 3.95
LosAngeles B3 ... 4.65
Milton,Pa. B6 ... 4.55
Minnequa,Colo. C10 ... 4.40
Niles,Calif. P1 ... 4.65
N.Tonawanda,N.Y. B11 ... 3.95
Pittsburg,Calif. C11 ... 4.65
Pittsburgh J5 ... 3.95
Seattle B3, N14 ... 4.70
So.Chicago,R2,U5,W14 ... 3.95
So.Duquesne,Pa. U5 ... 3.95
So.SanFrancisco,Calif. B3 ... 4.70
Sterling,Ill. N15 ... 4.55
Struthers,O. Y1 ... 3.95
Torrance,Calif. C11 ... 4.65
Weirton,W.Va. W6 ... 4.10
Youngstown R2, U5 ... 3.95

BAR SIZE ANGLES, S. Shapes
Aliquippa,Pa. J5 ... 3.95
Atlanta A11 ... 4.50
Niles,Calif. P1 ... 4.65
SanFrancisco S7 ... 5.00

BAR SIZE ANGLES, H.R. CARBON
Bethlehem,Pa. B2 ... 4.15

BARS Hot-Rolled Alloy
Bethlehem,Pa. B2 ... 4.675
Buffalo R2 ... 4.675
Canton,O. R2 ... 4.675
Canton,O. T7 ... 4.72
Clairton,Pa. U5 ... 4.675
Detroit R7 ... 4.824
Ecorse,Mich. G5 ... 5.025
Fontana,Calif. K1 ... 5.725
Gary,Ind. U5 ... 4.675
Houston S5 ... 5.075
Ind.Harbor,Ind. I-2, Y1 ... 4.675
Johnstown,Pa. B2 ... 4.675
KansasCity,Mo. S5 ... 5.274
Lackawanna,N.Y. B2 ... 4.675
LosAngeles B3 ... 5.725
Massillon,O. R2 ... 4.675
Midland,Pa. C18 ... 4.675
So.Chicago,R2,U5, W14 ... 4.675
So.Duquesne,Pa. U5 ... 4.675
Struthers,O. Y1 ... 4.675
Warren,O. C17 ... 4.675
Youngstown U5 ... 4.675

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 ... 4.925
Gary,Ind. U5 ... 4.925
Youngstown U5 ... 4.925

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 ... 5.925
Bessemer,Ala. T2 ... 5.925
Bethlehem,Pa. B2 ... 5.925
Clairton,Pa. U5 ... 5.925
Cleveland R2 ... 5.925
Ecorse,Mich. G5 ... 6.675
Fairfield,Ala. T2 ... 5.925
Fontana,Calif. K1 ... 6.975
Gary,Ind. U5 ... 5.925
Ind.Harbor,Ind. I-2 ... 5.925
IndianaHarbor,Ind. Y1 ... 6.425
Johnstown,Pa. B2 ... 5.925
Lackawanna,N.Y. B2 ... 5.925
LosAngeles B3 ... 6.625
Pittsburgh J5 ... 5.925
Seattle B3 ... 6.675
So.Duquesne,Pa. U5 ... 5.925
So.SanFrancisco B3 ... 6.675
Struthers,O. Y1 ... 6.425
Youngstown U5 ... 5.925

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ... 4.925
BeaverFalls,Pa. R2 ... 4.925
BeaverFalls,Pa. M12 ... 4.925
Buffalo B5 ... 4.925
Camden,N.J. P13 ... 5.375
Carnegie,Pa. C12 ... 4.925
Chicago B5 ... 4.925
Chicago W18 ... 4.925
Cleveland A7, C20 ... 4.925
Detroit P17, R7 ... 5.075
Detroit B5 ... 5.125
Elyria,O. W8 ... 4.925
FranklinPark,Ill. N5 ... 4.925
Gary,Ind. R2 ... 4.925
GreenBay,Wis. F7 ... 4.925
Hammond,Ind. I-2,M13 ... 4.925
Hartford,Conn. R2 ... 5.475
LosAngeles R2 ... 6.375
Mansfield,Mass. B5 ... 5.475
Massillon,O. R2, R8 ... 4.925
Monaca,Pa. S17 ... 4.925
Newark,N.J. W18 ... 5.375
Plymouth,Mich. P5 ... 5.175
Pittsburgh J5 ... 4.925
Putnam,Conn. W18 ... 5.475
Readville,Mass. C14 ... 5.475
St.Louis,Mo. M4 ... 5.30
So.Chicago,Ill. W14 ... 4.925
SpringCity,Pa. K3 ... 5.375
Struthers,O. Y1 ... 4.925
Waukegan,Ill. A7 ... 4.925
Youngstown Y1 ... 4.925
Youngstown F3 ... 4.925

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ... 6.00
BeaverFalls,Pa. M12 ... 6.00
Bethlehem,Pa. B2 ... 6.00
Buffalo B5 ... 6.00
Camden,N.J. P13 ... 6.40
Canton,O. R2 ... 6.00
Canton,O. T7 ... 5.90
Carnegie,Pa. C12 ... 6.00
Chicago B5 ... 6.00
Chicago W18 ... 6.00
Cleveland A7 ... 6.05
Cleveland C20 ... 6.00
Detroit P17, R7 ... 6.15
Detroit B5 ... 6.20
Donora,Pa. A7 ... 6.05
Elyria,O. W8 ... 6.00
Gary,Ind. R2 ... 6.00
Hammond,Ind. I-2, M13 ... 6.00
Hartford,Conn. R2 ... 6.45
Lackawanna,N.Y. B2 ... 6.00
Mansfield,Mass. B5 ... 6.45
Massillon,O. R2,R8 ... 6.00
Midland,Pa. C18 ... 6.00
Monaca,Pa. S17 ... 6.00
Newark,N.J. W18 ... 6.35
Plymouth,Mich. P5 ... 6.20
So.Chicago,Ill. R2, W14 ... 6.00
SpringCity,Pa. K3 ... 6.20
Struthers,O. Y1 ... 6.00
Warren,O. C17 ... 6.00
Waukegan,Ill. A7 ... 6.05
Worcester,Mass. A7 ... 6.35
Youngstown Y1 ... 6.00
Youngstown F3 ... 6.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ... 3.95
Atlanta A11 ... 4.50
Buffalo R2 ... 3.95
Cleveland R2 ... 3.95
Emeryville,Calif. J7 ... 4.70
Fairfield,Ala. T2 ... 3.95
Fontana,Calif. K1 ... 4.65
Gary,Ind. U5 ... 3.95
Houston S5 ... 4.35
Ind.Harbor,Ind. I-2, Y1 ... 3.95
Johnstown,Pa. B2 ... 3.95
KansasCity,Mo. S5 ... 4.55
Lackawanna,N.Y. B2 ... 3.95
LosAngeles B3 ... 4.65
Milton,Pa. B6 ... 4.55
Minnequa,Colo. C10 ... 4.75
Niles,Calif. P1 ... 4.65
Pittsburg,Calif. C11 ... 4.65
Pittsburgh J5 ... 3.95
SandSprings,Okla. S5 ... 4.85
Seattle B3, N14 ... 4.70
So.Chicago,Ill. R2 ... 3.95
So.Duquesne,Pa. U5 ... 3.95
So.SanFrancisco B3 ... 4.70
SparrowsPoint,Md. B2 ... 3.95
Sterling,Ill.(1) N15 ... 4.70
Struthers,O. Y1 ... 3.95
Torrance,Calif. C11 ... 4.65
Youngstown R2, U5 ... 3.95

BARS, Reinforcing (Fabricated; to consumers)
Huntington,W.Va. W7 ... 5.50
Johnstown, ¾-1" B2 ... 5.25
KansasCity S5 ... 6.05
LosAngeles B3 ... 5.45
Marion,O. P11 ... 5.25
Seattle B3, N14 ... 5.80
SandSprings S5 ... 6.45
So.SanFrancisco B3 ... 5.45
SparrowsPt. ¼-1" B2 ... 5.25
William port Pa. S19 ... 5.35

RAIL STEEL BARS
ChicagoHts.(3,4) C2 ... 4.75
ChicagoHts.(3,4) I-2 ... 4.75
Franklin Pa.(3,4) F5 ... 4.75
FortWorth,Tex.(26), T4 ... 4.85
Huntingt.W.Va.(3) W7 ... 4.75
Marion,O.(3) P11 ... 4.75
Moline,Ill.(3) R2 ... 4.65
Tonawanda(3,4) B12 ... 5.00
Williamsport(3) S19 ... 5.25
Williamsport(4) S19 ... 5.35

BARS, Wrought Iron
(Add 4.7% to base and extras)
Economy,Pa.(SR) B14 ... 9.60
Economy,Pa.(DR) B14 ... 11.90
Economy(Staybolt) B14 ... 12.20
McK.Rks.(Staybolt) L5 ... 14.50
McK.Rks.(SR) L5 ... 9.60
McK.Rks.(DR) L5 ... 13.00

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 ... 3.775
Ashland,Ky.(15) A10 ... 3.775
Butler,Pa. A10 ... 3.775
Cleveland J5, R2 ... 3.775
Conshohocken,Pa. A3 ... 4.175
Detroit M1 ... 3.80
Ecorse,Mich. G5 ... 3.925
Fairfield,Ala. T2 ... 3.775
Fontana,Calif. K1 ... 4.825
Gary,Ind. U5 ... 3.775
Geneva,Utah C11 ... 3.825
GraniteCity,Ill. G4 ... 4.10
Ind.Harbor,Ind. I-2, Y1 ... 3.775
Irvin,Pa. U5 ... 3.775
Lackawanna,N.Y. B2 ... 3.775
Munhall,Pa. U5 ... 3.775
Niles,O. N12 ... 3.825
Pittsburg,Calif. C11 ... 4.175
Pittsburgh J5 ... 3.775
Sharon,Pa. S3 ... 4.175
So.Chicago,Ill. W14 ... 3.775
SparrowsPoint,Md. B2 ... 3.775
Steubenville,O. W10 ... 3.775
Torrance,Calif. C11 ... 4.175
Warren,O. R2 ... 3.775
Weirton,W.Va. W6 ... 3.775
WestLeechburg,Pa. A4 ... 3.925
Youngstown U5, Y1 ... 3.775

SHEETS, H.R. (19 gage)
AlabamaCity,Ala. R2 ... 4.925
Dover,O. B1 ... 5.525
Mansfield,O. B6 ... 5.65
Niles,O. N12 ... 5.675
Torrance,Calif. C11 ... 5.525

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy
Cleveland J5, R2 ... 5.675
Conshohocken,Pa. A3 ... 5.925
Ecorse,Mich. G5 ... 6.225
Fairfield,Ala. T2 ... 5.675
Fontana,Calif. K1 ... 6.275
Gary,Ind. U5 ... 5.675
Ind.Harbor,Ind. I-2 ... 5.675
Ind.Harbor,Ind. Y1 ... 6.175
Irvin,Pa. U5 ... 5.675
Lackawanna(35) B2 ... 5.675
Munhall U5 ... 5.675
Pittsburgh J5 ... 5.675
Sharon,Pa. S3 ... 5.675
So.Chicago,Ill. U5 ... 5.675
SparrowsPoint(36), B2 ... 5.675
Warren,O. R2 ... 5.675
Weirton,W.Va. W6 ... 6.025
Youngstown U5 ... 5.675
Youngstown Y1 ... 6.175

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 ... 6.925
Ecorse,Mich. G5 ... 7.475
Fontana,Calif. K1 ... 7.875
Gary,Ind. U5 ... 6.925
IndianaHarbor,Ind. Y1 ... 7.425
IndianaHarbor,Ind. I-2 ... 6.925
Irvin,Pa. U5 ... 6.925
Lackawanna(37) B2 ... 6.925
Pittsburgh J5 ... 6.925
SparrowsPoint(38), B2 ... 6.925
Warren,O. R2 ... 6.925
Weirton,W.Va. W6 ... 7.275
Youngstown Y1 ... 7.425

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.675
Cleveland,Ky. R2	4.575
Ecorse,Mich. G5	4.775
Fairfield,Ala. T2	4.575
Follansbee,W.Va. F4	5.575
Fontana,Calif. K1	5.675
Gary,Ind. U5	4.575
Granite City,Ill. G4	5.275
Ind Harbor,Ind. I-2,Y1	4.575
Irvin,Pa. U5	4.575
Lackawanna,N.Y. B2	4.575
Middletown,O. A10	4.575
Pittsburg,Calif. C11	5.525
Pittsburgh,Pa. J5	4.575
Sparrows Point,Md. B2	4.575
Steubenville,O. W10	4.575
Warren,O. R2	4.575
Weirton,W.Va. W6	4.575
WestLeechburg,Pa. A4	5.45
Youngstown Y1	4.575

SHEETS, Galv'd No. 10 Steel

Alabama City,Ala. R2	5.675
Ashland,Ky. (8) A10	5.675
Canton,O. R2	5.675
Delphos,O. N16	5.675
Dover,O. R1	5.775
Fairfield,Ala. T2	5.675
Gary,Ind. U5	5.675
GraniteCity,Ill. G4	5.90
Ind Harbor,Ind. I-2	5.675
Irvin,Pa. U5	5.675
Kokomo,Ind.(13) C16	5.475
Martins Ferry,O. W10	5.675
Niles,O. N12	6.275
Pittsburg,Calif. C11	5.825
Sparrows Point,Md. B2	5.675
Steubenville,O. W10	5.675
Torrance,Calif. C11	5.825
Weirton,W.Va. W6	5.675

SHEETS, Galvanized No. 10, High Strength Low-Alloy

Irvin,Pa. U5	7.625
Sparrows Point(29) B2	7.775

SHEETS, Galvannealed Steel

Canton,O. R2	5.625
Irvin,Pa. U5	5.625
Kokomo,Ind.(13) C16	6.025
Niles,O. N12	6.825

SHEETS ZINCGRIP Steel No. 10

Butler,Pa. A10	5.325
Middletown,O. A10	5.325

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.925
Niles,O. R2 (28)	5.925
Weirton,W.Va. W6	5.775

SHEETS, Well Casing

Fontana,Calif. K1	5.31

BLUED Stock, 29 ga.

Yorkville,O. W10	7.00
Follansbee,W.Va. F4	7.10
Follansbee (23) F4	6.425

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.925
Cleveland R2	4.925
Gary,Ind. U5	4.925
GraniteCity,Ill. G4	5.625
Ind Harbor,Ind. I-2	4.925
Irvin,Pa. U5	4.925
Middletown,O. A10	4.925
Youngstown Y1	4.925

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.50
Fairfield,Ala. T2	6.60
Gary,Ind. U5	6.60
GraniteCity,Ill. G4	6.70
Ind Harbor,Ind. I-2, Y1	6.60
Irvin,Pa. U5	6.60
Niles,O. R2	6.60
Pittsburg,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.60
Weirton,W.Va. W6	6.60
Yorkville,O. W10	6.60

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
GraniteCity,Ill. G4	6.30
Ind Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.30

SHEETS, Culvert No. 16

	Cu Alloy	Cu Fe
Ashland,Ky. A10	5.80	
Canton,O. R2	5.925	6.375
Fairfield,Ala. T2	5.85	6.125
Gary,Ind. U5	5.85	6.125
Ind Harbor,Ind. I-2	5.85	6.125
Irvin,Pa. U5	5.85	6.125
Kokomo,Ind. C16	6.525	
Martinsey,O. W10	5.825	
Pittsburg,Cal. C11	6.625	
Sparrows Pt. B2	5.85	
Torrance,Cal. C11	6.625	

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	6.125
Fairfield,Ala. T2	6.125
MartinsFerry,O. W10	6.125

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	4.025
Cleveland R2	4.375
Ind Harbor,Ind. I-2	4.025
Warren,O. R2	4.375

SHEETS, Cold-Rolled Ingot Iron

Butler,Pa. A10	5.075
Cleveland R2	5.175
Middletown,O. A10	5.075
Warren,O. R2	5.175

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.325
Canton,O. R2	5.825

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.575
Middletown,O. A10	5.575

SHEETS, ALUMINIZED

Butler,Pa. A10	8.425

TIN PLATE, American 1.25 Coke (Base Box)

	lb	1.50 lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.70	9.05
Warren,O. R2	8.70	
Weirton,W.Va. W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.65	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40		
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

SHEETS, SILICON, H.R. or C.R. COILS (Cut lengths 1/2c lower)

	Field	Armature	Electric	Motor	Dynamo
BeechBottom W10 (cut lengths)	...	...	7.85	9.10	9.90
BrackenridgePa. A4	...	...	8.35	9.60	10.40
GraniteCity,Ill. G4 (cut lengths)	...	...	8.55	9.80	...
IndianaHarbor,Ind. I-2	7.55	7.85	(31)	(41)	...
Mansfield,O. E6 (cut lengths)	7.20	7.35	7.85	9.10	9.90
Niles,O. N12 (cut lengths)	7.05	7.35	7.85		
Vandergrift,Pa. U5	...	7.85	8.35	9.60	10.40
Warren,O. R2	7.55	7.85	8.35	9.60	10.40
Zanesville,O. A10	...	7.85	8.35	9.60	10.40

SHEETS, SILICON (22 Ga. Base) COILS (Cut Length 1/2c lower)

Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	10.45	11.00	11.70	12.50
Brackenridge,Pa. A4	10.95	...	...	...
Vandergrift,Pa. U5	10.95	11.50	12.20	13.00
Warren,O. R2	10.95	...	...	...
Zanesville,O. A10	10.95	11.50	12.20	13.00

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	...	...	15.35	15.85
Vandergrift,Pa. U5	13.50	14.35	15.35	15.85

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.70
Irvin,Pa. U5	7.70
Yorkville,O. W10	7.75

SHEETS, LF. Coated Ternes, 6 lb

Yorkville,O. W10	$8.65

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$8.75
Yorkville,O. W10	9.75

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10	5.475
Gary,Ind. U5	5.475
Mansfield,O. E6	6.60
Middletown,O. A10	5.475
Niles,O. N12	6.275
Weirton,W.Va. W6	5.475

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.825

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.75

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	5.65
Conshohocken,Pa. A3	5.90
Ecorse,Mich. G5	6.30
Fairfield,Ala. T2	5.65
Fontana,Calif. K1	6.50
Gary,Ind. U5	5.65
Ind Harb.,Ind. I-2	5.65
Ind Harbor,Ind. Y1	6.15
Lackawanna,N.Y. B2	5.70
LosAngeles(25) B3	6.40
Seattle(25) B3	6.65
Sharon,Pa. S3	5.65
So.SanFrancisco(25) B3	6.40
SparrowsPoint,Md. B2	5.70
Warren,O. R2	5.65
Weirton,W.Va. W6	6.10
Youngstown Y1	6.15
Youngstown U5	5.65

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5	7.45
Cleveland A7	7.30
Dover,O. G6	8.00
Ecorse,Mich. G5	8.15
Lackawanna,N.Y. B2	7.50
Sharon,Pa. S3	7.30
SparrowsPoint,Md. B2	7.50
Warren,O. R2	7.30
Weirton,W.Va. W6	7.95
Youngstown Y1	7.80

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.725
Alton,Ill. L1	4.20
Ashland,Ky.(8) A10	3.725
Atlanta,Ill. A11	4.275
Bessemer,Ala. T2	3.725
Bridgeport,Conn.(10) S15	4.225
Buffalo(27) R2	3.725
Butler,Pa. A10	3.725
Carnegie,Pa. S18	4.225
Conshohocken,Pa. A3	4.125
Detroit,Mi. M1	4.40
Ecorse,Mich. G5	4.025
Fairfield,Ala. T2	3.725
Fontana,Calif. K1	5.175
Gary,Ind. U5	3.725
Houston,Tex. S5	4.125
Ind Harbor,Ind. I-2,Y1	3.725
Johnstown,Pa.(25) B2	3.725
KansasCity,Mo.(9) S6	4.025
Lackawanna,N.Y.(32) B2	3.725
LosAngeles(25) B3	4.475
Milton,Pa. B6	4.35
Minnequa,Colo. T10	4.175
NewBritain(10) S15	4.225
N.Tonawanda,N.Y. B11	3.725
Pittsburg,Calif. C11	4.475
Riverdale,Ill. A1	3.725
SanFrancisco S7	5.00
Seattle(25) B3	4.725
Seattle N11	4.75
Sharon,Pa. S3	4.225
So.Chicago,Ill. W11	3.725
So.SanFrancisco(25) B3	4.475
SparrowsPoint,Md. B2	3.725
Sterling,Ill. N15	4.725
Torrance,Calif. C11	4.475
Warren,O. R2	3.725
Weirton,W.Va. W6	3.825
WestLeechburg,Pa. A4	3.975
Youngstown U5, Y1	3.725

STRIP, Hot-Rolled Alloy

Bridgeport,Conn.(10) S15	6.05
Carnegie,Pa. S18	6.45
Fontana,Calif. K1	7.30
Gary,Ind. U5	6.10
Houston,Tex. S5	6.50
KansasCity,Mo. S6	6.70
Midland,Pa. C18	5.85
NewBritn.,Conn.(10) S15	6.05
Sharon,Pa. S3	6.45
Youngstown U5	6.10

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Bridgeport,Conn.(10) S15	5.80
Butler,Pa. A10	5.10
Cleveland A7, J5	5.10
Dearborn,Mich. D2	6.05
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(10) G6	5.30
Ecorse,Mich. G5	5.30
Follansbee,W.Va. F4	5.10
Fontana,Calif. K1	6.75
FranklinPark,Ill.(40) T6	5.35
Ind Harbor,Ind. I-2	5.35
Lackawanna,N.Y. B2	5.10
LosAngeles C1	6.85
Mattapan,Mass. T6	5.95
Middletown,O. A10	5.10
NewBritain(10) S15	5.80

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Bereo,O. C7		6.80	7.40	9.45	11.65
Bridgeport,Conn.(10) S15	5.80	7.60	8.25	10.20	12.60
Bristol,Conn. W1			8.55	10.60	
Carnegie,Pa. S18		7.65	8.25	10.20	12.60
Cleveland A7	5.10	7.50	8.25	10.20	12.60
Dearborn,Mich. D3	6.05	7.90	8.60		
Detroit D2	5.60	7.90	8.60		
Detroit M1	5.45	7.60	8.30		
Dover,O. G6	5.30	7.65	8.25	10.20	12.60
FranklinPark,Ill. T6	5.45	7.45	8.00	10.05	12.65
Harrison,N.J. C18			8.55	10.60	12.80
Mattapan,Mass. T6	5.95	7.65	8.55	10.60	12.80
NewBritn.,Conn.(10) S15	5.80	7.65	8.25	10.20	12.60
NewCastle,Pa. B4	5.80	7.65	8.25	10.20	
NewCastle,Pa. E5	5.80	7.65	8.25	10.20	12.60
NewHaven,Conn. D2	6.70	7.60	8.20		
NewYork W3		7.50	8.55	10.50	12.80
Pawtucket,R.I. N8, Cleve.orPitts.Base		7.65	8.25	10.20	12.60
Worcester,Mass.,Base	6.30	7.50	8.55	10.50	12.80
Sharon,Pa. S3	5.80	7.65	8.25	10.20	12.60
Trenton,N.J. R5		7.50	8.55	10.50	12.80
Wallingford,Conn. W2	6.30	7.60	8.20	10.15	12.65
Warren,O. T5	6.20	7.65	8.25	10.20	12.60
Weirton,W.Va. W6	5.80	7.65	8.25	10.20	12.60
Worcester,Mass. A7	5.40	7.60	8.55	10.50	12.80
Worcester,Mass. T6	5.95	7.60	8.55	10.50	12.80
Youngstown C8		7.65	8.25	10.20	12.60

Spring Steel (Tempered)

Trenton,N.J. R5 (29)		10.30	12.50	15.35
Harrison,N.J. C18		10.30	12.50	15.35
NewYork W3		10.30*	12.50*	15.35*
Youngstown C8		10.30	12.50	15.35

* Plus 1.575 per 100 lb.

STRIP, Hot-Rolled Alloy

NewCastle,Pa. B4	5.80
NewCastle,Pa.(40) E5	5.70
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.60
Pawtucket,R.I. R3	6.45
Pawtucket,R.I.(21) N8	6.30
Riverdale,Ill.(40) A1	5.35
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.80
SparrowsPoint,Md. B2	5.10
Trenton,N.J. R5	6.45
Wallingford,Conn. W2	6.30
Warren,O.(40) T5	5.70
Warren,O. R2	5.10
Weirton,W.Va. W6	5.10
Youngstown C8 (40)	5.70
Youngstown Y1	5.10

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.70
Weirton,W.Va. W6	5.10
Youngstown C8	5.70

STRIP, Cold-Rolled Alloy Steel

Bridgeport,Conn.(10) S15	12.15
Carnegie,Pa. S18	12.00
Cleveland A7	11.40
Dover,O. G6	11.90
Fontana,Calif. K1	13.05
Harrison,N.J. C18	12.00
Midland,Pa. C18	12.00
NewBritn.,Conn.(10) S15	12.15
Pawtucket,R.I.(11) N8	12.15
Pawtucket,R.I.(12) N8	12.45
Sharon,Pa. S3	12.00
Worcester,Mass. A7	11.70
Youngstown C8	12.00

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.975
Warren,O. R2	4.325

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.70

TIGHT COOPERAGE HOOP

Atlanta,Ill. A11	4.45
Riverdale,Ill. A1	4.30
Sharon,Pa. S3	4.55
Youngstown C8	4.45

Key to Producers

A1 Acme Steel Co.	C10 Colorado Fuel & Iron	F7 Ft. Howard Steel & Wire	
A3 Alan Wood Steel Co.	C11 Columbia-Geneva Steel	G2 Globe Iron Co.	
A4 Allegheny Ludlum Steel	C12 Columbia Steel & Shaft.	G3 Globe Steel Tubes Co.	
A7 American Steel & Wire	C13 Columbia Tool Steel Co.	G4 Granite City Steel Co.	
A8 Anchor Drawn Steel Co.	C14 Compressed Steel Shaft.	G5 Great Lakes Steel Corp.	
A9 Angell Nail & Chaplet	C16 Continental Steel Corp.	G6 Greer Steel Co.	
A10 Armco Steel Corp.	C17 Copperweld Steel Co.	H1 Hanna Furnace Corp.	
A11 Atlantic Steel Co.	C18 Crucible Steel Co.	I-1 Igoe Bros., Inc.	
A13 American Cladmetals Co.	C19 Cumberland Steel Co.	I-2 Inland Steel Co.	
B1 Babcock & Wilcox Co.	C20 Cuyahoga Steel & Wire	I-3 Interlake Iron Corp.	
B2 Bethlehem Steel Co.	C22 Claymont Steel Products Dept., Wickwire Spencer Steel Division	I-4 Ingersoll Steel Div. Borg-Warner Corp.	
B3 Beth. Pac. Coast Steel	D2 Detroit Steel Corp.	I-7 Indiana Steel & Wire Co.	
B4 Blair Strip Steel Co.	D3 Detroit Tube & Steel	J1 Jackson Iron & Steel Co.	
B5 Bliss & Laughlin Inc.	D4 Disston & Sons, Henry	J3 Jessop Steel Co.	
B6 Bonardi Steel Corp.	D6 Driver Harris Co.	J4 Johnson Steel & Wire Co.	
B8 Brieburn Alloy Steel	D7 Dickson Weatherproof Nail Co.	J5 Jones & Laughlin Steel	
B11 Buffalo Bolt Co.	E1 Eastern Gas&Fuel Assoc.	J6 Joslyn Mfg. & Supply	
B12 Buffalo Steel Div., H. K. Porter Co.	E2 Eastern Stainless Steel	J7 Judson Steel Corp.	
B14 A. M. Byers Co.	E4 Electro Metallurgical Co.	J8 Jersey Shore Steel Co.	
C1 Calstrip Steel Corp.	E5 Elliott Bros. Steel Co.	K1 Kaiser Steel Corp.	
C2 Calumet Steel Div. Borg-Warner Corp.	E6 Empire Steel Corp.	K2 Keokuk Electro Metals	
C4 Carpenter Steel Co.	F2 Firth Sterling Inc.	K3 Keystone Drawn Steel	
C5 Central Iron & Steel Div. Barium Steel Corp.	F3 Fitzsimons Steel Co.	K4 Keystone Steel & Wire	
C7 Cleve. Cold Rolling Mills	F4 Follansbee Steel Corp.	L1 Laclede Steel Co.	
C8 Cold Metal Products Co.	F5 Franklin Steel Div. Borg-Warner Corp.	L2 LaSalle Steel Co.	
C9 Colonial Steel Co.	F6 Fretz-Moon Tube Co.	L3 Latrobe Steel Co.	
		L5 Lockhart Iron & Steel	
		L6 Lone Star Steel Co.	
		L7 Lukens Steel Co.	

WIRE, Merchant Quality

(6 to 8 gage)	An'ld.	Galv.
Alabama City, Ala.	6.075	6.225
Aliquippa, Pa.	6.075	6.525‡
Atlanta, All.	6.325	6.575
Bartonville, Ill. K4	6.075	6.40
Buffalo, W12	5.925	
Cleveland, A7	6.075	6.225
Crawfordsville, Ind. M8	6.175	6.325
Donora, Pa. A7	6.075	6.225
Duluth, Minn. A7	6.075	6.225
Fairfield, T2	6.075	6.225
Houston, Tex. S8	6.475	6.80
Johnstown, B2	6.075	6.45
Joliet, Ill. A7	6.075	6.225
Kansas City, Mo. S8	6.675	7.00
Kokomo, C16	6.175	6.425
Los Angeles, B3	7.025	
Minnequa, C10	6.325	6.70*
Monessen, P7	6.075	6.45
Palmer, W12	5.925	
Pitts. Calif., C11	7.025	7.175
Pittsburgh, C15, P12	6.475	
Rankin, A7	6.075	6.225
So. Chicago, R2	6.075	6.325
So. S. Fran., C10	7.025	7.40*
Sparrows Pt., B2	6.175	6.55
Sterling, Ill. (1), N15	6.075	6.375
Struthers, O., Y1	6.075	6.475
Torrance, Calif., C11	7.025	
Worcester, A7	6.375	6.525

*Based on 14c zinc, 14.50c zinc, 17.5c zinc.

WIRE (16 gage)

	An'ld. Stone	Galv. Stone
(Add 4.75 on base and extras)		
Aliquippa, Jo.	10.15	12.15
Bartonville, Ill. K4	10.25	12.00*
Cleveland, A7	10.25	11.55
Crawfordsville, Ind. M8	10.75	12.50
Fostoria, O., S1	10.10	11.60
Johnstown, B2	10.75	12.65‡
Kokomo, C16	10.65	12.325
Minnequa, C10	10.10	12.425*
Palmer, Mass. W12	10.25	12.15
Pitts. Cal., C11	10.60	11.90
Sparrows Pt., B2	10.85	12.65‡
Sterling (1), Ill., N15	10.75	12.15‡
Waukegan, A7	10.25	11.55
Worcester, A7		11.85‡

*Based on 14c zinc, 14.50c zinc. ‡Includes 4.7% increase.

WIRE, Manufacturers Bright, Low Carbon

Alabama City, Ala., R2	5.225
Aliquippa, Pa., Jo (42)	4.85
Atlanta, All.	5.475
Alton, Ill., L1	5.40
Bartonville, Ill., K4	5.325
Buffalo, W12	5.275
Chicago, W13	5.475
Cleveland, A7, C20	5.225
Crawfordsville, Ind., M8	5.325
Donora, Pa., A7	5.225
Duluth, Minn., A7	5.225
Fairfield, Ala., T2	5.225
Fostoria, O., (24), S1	5.725
Houston, S8	5.625
Johnstown, Pa., B2	5.225
Joliet, Ill., A7	5.225
Kansas City, Mo., S8	5.525
Kokomo, Ind., C16	5.325
Los Angeles, B3	6.175
Minnequa, Colo., C10	5.475
Monessen, Pa., P7	5.475
Newark, 6-8 ga., I-1	5.88
No. Tonawanda, B11	5.225
Palmer, Mass., W12	5.325
Pittsburg, Calif., C11	6.175
Portsmouth, O., P12	5.625
Rankin, Pa., A7	5.225
S. Chicago, Ill., R2	5.225
So. San Francisco, C10	6.175
Sparrows Point, Md., B2	5.325
Sterling, Ill., (1), N15	5.225
Struthers, O., Y1	5.225
Torrance, Calif., C11	6.175
Waukegan, Ill., A7	5.225
Worcester, Mass., A7	5.525

WIRE, Cold-Rolled Flat

Anderson, Ind., G6	6.20
Buffalo, W12	(43) 6.55
Cleveland, A7	(43) 5.85
Crawfordsville, Ind., M8	(48) 6.70
Dover, O., G6	6.20
Fostoria, O., S1	(43) 6.00
Kokomo, Ind., C16	(43) 6.50
Franklin Park, Ill., T6	(43) 6.20
Massillon, O., R8	(43) 5.85
Monessen, Pa., P16	(43) 6.35
Monessen, Pa., P7	(43) 6.10
Pawtucket, R.I., (42), N8	(43) 6.85
Trenton, N.J., R5	(43) 6.15
Worcester, Mass., A7	(43) 6.15
Worcester, Mass., W12	(43) 6.65

WIRE, Galv'd ACSR for Cores

Bartonville, Ill., K4	8.90
Monessen, Pa., P16	(43) 8.50
Muncie, Ind., I-7	(43) 8.70
Roebling, N.J., R5	(43) 8.80
Sparrows Pt., Md., B2	(43) 8.60
Johnstown, Pa., B2	(43) 8.80

ROPE WIRE

Alton, Ill., L1	(43) 8.75
Bartonville, Ill., K4	8.95
Buffalo, W12	(43) 8.55
Fostoria, O., S1	(43) 8.85
Johnstown, Pa., B2	(43) 8.85
Monessen, Pa., P16	(43) 8.80
Monessen, Pa., P7	(43) 8.80
Muncie, Ind., I-7	(43) 8.75
Palmer, Mass., W12	(43) 8.85
Portsmouth, O., P12	(43) 8.55
Roebling, N.J., R5	(43) 8.85
Sparrows Pt., B2	(43) 8.65
Struthers, O., Y1	(43) 8.85
Worcester, Mass., A7	(43) 8.80

(A) Plow and Mid Plow, add 0.25c for improved plow.

WIRE, MD Spring, High Carbon

Aliquippa, Pa., Jo	(43) 6.25
Alton, Ill., L1	(43) 6.55
Bartonville, Ill., K4	6.64
Buffalo, W12	(43) 6.25
Cleveland, A7	(43) 6.25
Donora, Pa., A7	(43) 6.25
Duluth, Minn., A7	(43) 6.25
Fostoria, O., S1	(43) 6.25
Johnstown, Pa., B2	(43) 6.25
Millbury, (2), N6	(43) 8.05
Minnequa, Colo., C10	(43) 6.50
Monessen, Pa., P7	(43) 6.25
Monessen, Pa., P16	6.75
Muncie, Ind., I-7	(43) 6.45
Palmer, Mass., W12	(43) 6.55
Pittsburg, Calif., C11	(43) 7.20
Roebling, N.J., R5	(43) 6.55
Port Smith, O., P12	(43) 6.25
So. Chicago, Ill., R2	(43) 6.25
So. San Fran., C10	7.20
Sparrows Pt., Md., B2	(43) 6.35
Struthers, O., Y1	(43) 6.25
Trenton, N.J., A7	(43) 6.55
Waukegan, Ill., A7	(43) 6.25
Worcester, A7, T6	(43) 6.55
Worcester, Mass., W12	(43) 6.55
Worcester, Mass., J1	(43) 6.75

WIRE, Upholstery Spring

Aliquippa, Pa., Jo	6.275
Alton, Ill., L1	6.50
Buffalo, W12	6.275
Cleveland, A7	6.275
Donora, Pa., A7	6.275
Duluth, Minn., A7	6.275
Johnstown, Pa., B2	6.275
Los Angeles, B3	7.225
Minnequa, Colo., C10	6.525
Monessen, Pa., P7	6.275
Monessen, Pa., P16	(42) 6.40
New Haven, Conn., A7	6.575
Palmer, Mass., W12	6.375
Pittsburg, Calif., C11	7.225
Portsmouth, O., P12	6.275
Roebling, N.J., R5	6.375
So. Chicago, Ill., R2	6.275
So. San Francisco, C10	7.225
Sparrows Point, Md., B2	6.375
Torrance, Calif., C11	7.225
Trenton, N.J., A7	6.475
Waukegan, Ill., A7	6.275
Worcester, Mass., A7	6.375

WIRE, Fine & Weaving (8 Coils)

Alton, Ill., L1	(43) 9.20
Bartonville, Ill., K4	9.42
Buffalo, W12	(43) 8.90
Chicago, W13	9.32
Cleveland, A7	(43) 8.90
Crawfordsville, Ind., M8	(43) 8.90
Fostoria, O., S1	(43) 8.90
Johnstown, Pa., B2	(43) 8.90
Kokomo, Ind., C16	(43) 8.90
Monessen, Pa., P16	(43) 8.90
Muncie, Ind., I-7	(43) 9.10
Palmer, Mass., W12	(43) 9.20
Roebling, N.J., R5	(43) 9.20
Waukegan, Ill., A7	(43) 8.90
Worcester, Mass., A7, T6	(43) 9.20

WIRE, Tire Bead

Bartonville, Ill., K4	11.51
Monessen, Pa., P16	(43) 11.40
Roebling, N.J., R5	(43) 11.50

WOVEN FENCE, 9-15½ Ga. Col.

Alabama City, Ala., R2	134
Ala. City, Ala., 17-18 ga.	R2 222
Aliquippa, Pa., 9-11½ ga.	Jo 1391
Atlanta, All.	140
Bartonville, Ill., (19), K4	137
Crawfordsville, Ind., M8	138
Donora, Pa., A7	133
Duluth, Minn., A7	133
Fairfield, Ala., T2	133
Houston, Tex., S8	146
Johnstown, Pa., B2	138
Johnstown, 17ga. & 9"	B2 229
Joliet, Ill., A7	133
Kansas City, Mo., S8	149
Kokomo, Ind., C16	140
Minnequa, Colo., C10	146*
Monessen, Pa., P7	138
Pittsburg, Calif., C11	156
Rankin, Pa., A7	133
So. Chicago, Ill., R2	135
Sterling, Ill., (1), N15	136

*On 14c zinc, 17.5c zinc.

FENCE POSTS

	Col.
Chicago Hts., Ill., C2	140
Duluth, Minn., A7	133
Franklin, Pa., P5	145
Huntington, W.Va., W7	148
Johnstown, Pa., B2	148
Marion, O., P11	140
Minnequa, Colo., C10	138
Moline, Ill., B2	136
So. Chicago, Ill., R2	140
Tonawanda, N.Y., B12	148
Williamsport, Pa., S19	158

WIRE, Barbed

	Col.
Alabama City, Ala., R2	144
Aliquippa, Pa., Jo	1481
Atlanta, All.	149
Bartonville, Ill., (19), K4	146
Crawfordsville, Ind., M8	147
Donora, Pa., A7	142
Duluth, Minn., A7	142
Fairfield, Ala., T2	142
Houston, Tex., S8	154
Johnstown, Pa., B2	145
Joliet, Ill., A7	142
Kansas City, Mo., S8	158
Kokomo, Ind., C16	149
Minnequa, Colo., C10	153*
Monessen, Pa., P7	147
Pittsburg, Calif., C11	162
Rankin, Pa., A7	142
So. Chicago, Ill., R2	144
So. San Fran., Calif., C10	162*
Sparrows Point, Md., B2	147
Sterling, Ill., (1), N15	146

*Based on 14c zinc, 17.5c zinc.

BALE TIES, Single Loop

	Col.
Alabama City, Ala., R2	132
Atlanta, All.	135
Bartonville, Ill., (19), K4	132
Crawfordsville, Ind., M8	132
Donora, Pa., A7	132
Duluth, Minn., A7	132
Fairfield, Ala., T2	132
Joliet, Ill., A7	132
Kansas City, Mo., S8	144
Kokomo, Ind., C16	134
Minnequa, Colo., C10	137
Pittsburg, Calif., C11	156
So. Chicago, Ill., R2	132
So. San Fran., Calif., C10	156
Sparrows Point, Md., B2	134
Sterling, Ill., (1), N15	132

TRACK BOLTS (20) Treated

Kansas City, Mo., S8	(46) 9.85
Lebanon, Pa., (31), B2	9.85
Minnequa, Colo., C10	9.85
Pittsburgh, (6), P14	9.85

AXLES

Ind Harbor, Ind., S13	5.65
Johnstown, Pa., B2	5.65

NAILS, Stock

To dealers & mfrs. (7)	Col.
Alabama City, Ala., R2	127
Aliquippa, Pa., Jo	127
Atlanta, All.	130
Bartonville, Ill., (19), K4	127
Chicago, Ill., W13	127
Cleveland, A7, (44)	125
Crawfordsville, Ind., M8	127
Donora, Pa., A7	127
Duluth, Minn., A7	127
Fairfield, Ala., T2	127
Galveston, Tex., I7	134
Houston, Tex., S8	134
Johnstown, Pa., B2	127
Joliet, Ill., A7	127
Kansas City, Mo., S8	136
Kokomo, Ind., C16	129
Minnequa, Colo., C10, (44)	123
Monessen, Pa., P7	127
Pittsburg, Calif., C11	146
Portsmouth, O., P12	132
Rankin, Pa., A7	127
So. Chicago, Ill., R2	127
Sparrows Pt., Md., B2	126
Sterling, Ill., (1), N15	127
Torrance, Calif., C11	147
Worcester, Mass., A7	133

STAPLES, Polished, Stock

To dealers & mfrs. (7)	Col.
Alabama City, Ala., R2	126
Aliquippa, Pa., Jo	126
Atlanta, All.	129
Bartonville, Ill., (19), K4	126
Chicago, W13	127
Crawfordsville, Ind., M8	128
Donora, Pa., A7	126
Duluth, Minn., A7	126
Fairfield, Ala., T2	126
Johnstown, Pa., B2	126
Joliet, Ill., A7	126
Kokomo, Ind., C16	128
Minnequa, Colo., C10, (46)	123
Monessen, Pa., P7	127
Pittsburg, Calif., C11	144
Portsmouth, O., P12	132
Rankin, Pa., A7	126
So. Chicago, Ill., R2	126
Sparrows Pt., Md., B2	126
Sterling, Ill., (1), N15	126
Torrance, Calif., C11	146
Worcester, Mass., A7	132

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken, Pa., A3	$7.80
Wheeling, W.Va., W10	7.80

TIE PLATES

Fairfield, Ala., T2	4.775
Gary, Ind., U5	4.775
Ind Harbor, Ind., I-2	4.775
Lackawanna, N.Y., B2	4.775
Minnequa, Colo., C10	$55.00*
Pitt burg, Calif., C11	4.925
Seattle, B3	4.925
Steelton, Pa., B2	4.775
Torrance, Calif., C11	4.925

*Per net ton.

JOINT BARS

Bessemer, Pa., U5	4.925
Fairfield, Ala., T2	4.925
Ind Harbor, Ind., I-2	4.925
Joliet, Ill., U5	4.925
Lackawanna, N.Y., B2	4.925
Minnequa, Colo., C10	4.925
Steelton, Pa., B2	4.925

STANDARD TRACK SPIKES

Ind Harbor, Ind., I-2, Y1	6.65
Kansas City, Mo., S8	6.90
Lebanon, Pa., B2	6.65
Minnequa, Colo., C10	6.65
Pittsburgh, Jo	6.65
Seattle, B3	7.15
So. Chicago, Ill., R2	6.65
Struthers, O., Y1	6.65
Youngstown, R2	6.65

RAILS

	Std. No. 1	Std. No. 2	Std. All No. 2	Tee Rails 60 lb & Under
Bessemer, Pa., U5	3.775	3.675	3.725	4.25
Kansas City, Mo., T2	3.775	3.675		4.25
Fairfield, Ala., T2				4.25
Gary, Ind., U5	3.775	3.675	3.725	
Huntington, W.Va., W7				5.25
Indiana Harbor, Ind., I-2	3.775	3.675	3.725	
Johnstown, Pa., B2				(16)4.25
Lackawanna, N.Y., B2	3.775	3.675		4.25
Minnequa, Colo., C10	$23.50*	$23.50*		4.75
Steelton, Pa., B2	3.775	3.675		
Williamsport, Pa., S19				5.00

*Per net ton.

TOOL STEEL

(Prices subject to 4.7% increase)

Grade	$ per lb
Regular Carbon	0.200
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr. Hot Work	0.500
Hi Carbon-Cr.	0.650

Grade by Analysis

W	Cr	V	Co	
18	4	1		1.505
18	4	2		1.65; 1.66
20	2½	4	12	12.25; 3.53; 3.675
14	4	2	7	2.460
18	2½	4	12½	2.125
18	4	2	9	2.445; 2.45
13	4	3		1.6025
6	3.25	0.5		1.01

W	Cr	V	Mo	
6	4	1.5	5	0.90; 0.905
6	4	3	6	1.190
1.5	4	1	8.5	0.810

Tool steel producers include: AE, AS, B2, Bs, C4, C6, C13, C18, D1, F2, J3, L3, M14, S8, U4, V2 and V3.

FOOTNOTES

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(6) Chicago or Birmingham base.
(7) To jobbers, 5 carlots base.
(8) 16 gage and heavier.
(9) 6" and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) A44 0.50c for 17 Ga. & heavier.
(15) ⅝" and thinner.
(16) 60" & and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn. base.
(22) Incl. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 5.90c.
(27) Bar mill sizes.
(28) Reinforced.
(29) Add $1.50 per ton.
(30) Sheared; add 0.25c for universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 7.85c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter, 60" & narrower.
(38) 14 gage & lighter, 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.053", 0.055" and heavier, 0.25c higher.
(41) 0.10c for cut lengths.
(42) Plus 0.25c per 100 lb.
(43) Plus 4.75 per base and extras.
(44) Plus 4c per 100 lb.
(45) Plus 6c per 100 lb.
(46) Plus 2.2 per cent.
(48) Reinforcing mill.

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
N2 National Supply Co.
N3 National Tube Div.
N4 Nelsen Steel & Wire Co.
N6 NewEng.-HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Div.
N14 Northwest. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhodesland Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div., Eaton Mfg.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Div.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S24 Seidelhuber Steel
T2 Tenn. Coal & Iron Div.
T4 Tenn. Prod. & Chem.
T5 Texas Steel Co.
T6 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
U4 Universal Cyclops Steel
U5 United States Steel Corp.
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West Auto Mach Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet&Tube

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BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼		1½		2		2½		3	
List Per Ft.	8.5c		11.5c		17c		23c		27.5c		37c		58.5c		76.5c							
Pounds Per Ft.	0.85		1.13		1.68		2.28		2.73		3.68		5.82		7.62							
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	32.5	15.25	35.5	18.25	38	20.75	38.5	20.5	39	21	39.5	21.5	40	21.25	40	21.25						
Alton, Ill. L1 (†)	29.5	10.5	32.5	14.5	35	18	35.5	18.5	36	19.5	36.5	20	37	20.5	37	20.5						
Benwood, W. Va. W10	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	21.5	39.5	22	40	21.75	40	21.75						
Etna, Pa. N2 (†)	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	22.25	39.5	22	40	21.75	40	21.75						
Fontana, Calif. K1 (†)	19.5	0.25	22.5	4.25	25	7.75	25.5	7.5	26	8.5	26.5	9	27	8.75	27	8.75						
Ind. Harbor, Ind. Y1 (†)	31.5	14.25	34.5	18.25	37	21.75	37.5	21	38	22	38.5	22.25	39	21.75	39	21.75						
Lorain, O. N3 (*)	32.5	22.25	35.5	26.25	38	29.75	38.5	27.25	39	28.25	39.5	28.75	40	26.25	40	26.25						
Sharon, Pa. M6	32.5	14.25	35.5	18.25	38	21.25	38.5	20.50	39	21.00	39.5	21.50	40	20.75	40	20.75						
Sparrows Pt., Md. B2	30.5	11.25	33.5	15.25	36	18.75	36.5	18.5	37	19.5	37.5	20	38	19.75	38	19.75						
Youngstown R2 (**)	32.5	16.25	35.5	20.25	38	23.75	38.5	22.75	39	23.75	39.5	24.25	40	23.25	40	23.25						
Youngstown Y1 (‡)	32.5	15.25	35.5	19.25	38	22.75	38.5	22.00	39	23.00	39.5	23.50	40	22.75	40	22.75						
Wheatland, Pa. W9	32.5	13.25	35.5	16.25	38	18.75	38.5	19	39	19.5	39.5	20	40	20.25	40	20.25						

SEAMLESS STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft.	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft.	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
Ambridge, Pa. N2	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
Lorain, O. N3 (*)	24	12.75	27	12.75	27	12.75	29	14.75	29	14.75	33.75	19.5	33.75	19.5
Youngstown Y1 (‡)	24	7.50	27	9.25	27	9.25	29	11.25	29	11.25	33.75	16	33.75	16

ELECTRIC WELD STANDARD PIPE, T & C

Youngstown, R2 (**)	24	8.25	27	9.75	27	9.75	29	11.75	29	11.75	33.75	16.5	33.75	16.5

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		4	
List Per Ft.	5.5c		6c		6c		92c		$1.09	
Pounds Per Ft.	0.24		0.42		0.57		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Benwood, W. Va. W10	29.5	+0.25	23.25	+3.5	17.75	+7.75	33	14.25	33	14.25
Butler, Pa. F6 (†)	30.5	1.25	25	+1.75	20	+5.5	..	....	..	....
Etna, Pa. N2 (†)	30.5	1.25	25	+1.75	20	+5.5	33	14.25	33	14.25
Sharon, Pa. M6 (‡)	29.5	−1.75	23	+2.25	18	+5.25	..	....	..	....
Sharon, Pa. S4 (†)	30.5	1.25	25	+1.75	20	+5.5	..	....	..	....
Sparrows Pt., Md. B2	28.5	+0.75	23	+3.75	18	+7.50	..	....	..	....
Youngstown R2 (**)	..	....	..	....	..	....	33	15.75	33	15.75
Wheatland, Pa. W9	28.5	+0.75	23	+3.75	18	+7.50	..	....	..	....

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 12.50c; (**), 11.50c; (*), 5c, with discounts adjusted depending on price of zinc at time of shipment.

CLAD STEELS

(Cents per pound; add 4.7% to base price and extras)

Cladding Stainless	Plates: Carbon Base 10%	Plates: Carbon Base 20%	Sheets: Carbon Base 10%	Sheets: Carbon Base 20%	Sheets: Copper Base Both Sides
302	....	....	19.75	26.24-27.50	77.00
304	25.00	29.50	24.50	27.50-27.77	77.00
309	30.50	35.00	....	....	....
310	36.50	41.00	....	....	144.00
316	29.50	34.00	26.00	35.92-36.50	....
317	34.50	39.00	....	....	....
318	33.50	38.00	....	....	....
321	26.50	31.00-32.00	23.00	33.00	111.00
347	27.50	32.00	24.00	33.50-33.83	130.00
405	21.25	27.75	....	....	....
410	20.75	27.25	....	....	....
Nickel	33.55	45.15	....	....	....
Inconel	41.23	54.18	....	....	165.00
Monel	34.93	46.28	....	....	....
Copper*	....	....	....	41.00	....

	Strip: Carbon Base, Cold-Rolled 10%	Strip: Carbon Base, Cold-Rolled Both Sides	Strip: Carbon Base, Hot-Rolled 10%	Strip: Carbon Base, Hot-Rolled Both Sides
Nickel	41.00	54.00	....	....
Copper*	23.70	26.65	20.20	26.40

* Deoxidized. Production points for carbon base products: Stainless plates, sheets, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, copper-clad strip, Carnegie, Pa. S18; Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in & smaller diam	15
⅝-in. & ⅝-in.	18.5
¾-in. and larger	17.5
Longer than 6 in.:	
All diams.	14
Lag bolts, all diams.:	
6 in. and shorter	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap and Sleigh Shoe	21
Tire Bolts	21
Boiler & Fitting-Up Bolts	31

NUTS

H.P. & C.P. Square:	Reg. Hvy
½-in. & smaller	15 15
⅝-in. & ⅝-in.	12 6.5
¾-in.-1¼-in.	9 1
1⅜-in. & larger	7.5 1
H.P. Hex.:	
½-in. & smaller	26 22
⅝-in. & ⅝-in.	16.5 6.5
¾-in.-1½-in.	12 2
1⅝-in. & larger	8.5 2
C.P. Hex:	
½-in. & smaller	26 22
⅝-in. & ⅝-in.	23 17.5
¾-in. & 1½-in.	19.5 12
1⅝-in. & larger	12 6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
½-in. & smaller	35	28.5
⅝-in. & ⅝-in.	29.5	22
¾-in.-1½-in.	24	15
1⅝-in. & larger	13	8.5
⅞-in. & smaller		Light 35
1-in. to ⅝-in.		28.5
¾-in. to 1½-in		26

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

COAL, CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	36.00
Toluol, one deg.	30.00-33.00
Industrial xylol	30.00-33.50

Per ton, bulk, ovens

Sulphate of ammonia	$44-45
Birmingham area	$49.50

Cents per pound, ovens

Phenol, 40 (carlots, non-returnable drums)	17.25

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 70%, $43; 60%, $40.

Imported, net ton, duty paid, metallurgical grade, $30-$35.

METALLURGICAL COKE

Price net ton

BEEHIVE OVENS

Connellsvl.fur.	$14.50-15.00
Connellsvl.fdy.	16.50-17.50
New River foundry	20.80
Wise county, foundry	15.95
Wise county, furnace	15.20

OVEN FOUNDRY COKE

Kearney, N. J. ovens	$24.00
Everett, Mass., ovens	
New England, del.	*26.05
Chicago ovens	24.50
Chicago, del.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, del.	28.12
Cincinnati, del.	25.85
Painesville, O., ovens	25.50
Cleveland, del.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	21.65
Cincinnati, del.	26.58
LoneStar,Tex., ovens	18.50
Philadelphia, ovens	23.95
Swedeland, Pa., ovens	23.85
St. Louis, ovens	
St. Louis, del.	26.00
Portsmouth, O., ovens	24.00
Cincinnati, del.	26.62
Detroit, ovens	25.50
Detroit, del.	26.50
Buffalo, del.	28.08
Flint, del.	28.23
Pontiac, del.	27.06
Saginaw, del.	28.58

*Or within $4.55 freight zone from works.

NOTE: Current prices on boiler tubes, electrodes and rivets appeared on page 181 Mar. 16

STAINLESS STEEL

(Add 4.7% to extras where new extra cards have not been issued)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	44.25	36.50	33.25
302	44.50	39.75	34.00
303	46.50	43.50	36.50
304	46.50	41.75	35.50
309	56.50	50.25	48.25
316	61.50	63.50	53.00
321	53.00	52.00	40.00
347	58.00	56.50	44.75
410	39.00	32.75	27.50
416	40.00	40.00	28.00
420	47.00	50.25	33.50
430	41.50	33.25	28.00
501	29.25	27.75	15.25

Balt., Types 301-347 and 430 sheets, except 303 and 309 F2.

Brackenridge, Pa. sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa. sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00c on Type 301; 36.50c, 302; 38.50c, 304; 58.50c, 316; 52.00c, 347; 30.50c, 410; 31.00c, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire except Types 501 & 502 J4 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Harrison, N. J., wire, Type 302, 33.00c; Type 304, 34.50c; Type 316, 51.50c, including 4.7% increase on base price.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410, bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Muncie, Ind., wire 1-7 quotes types 302, 304, 430.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars U4.

Wallingford, Conn., strip W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309, 316 sheets 62.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

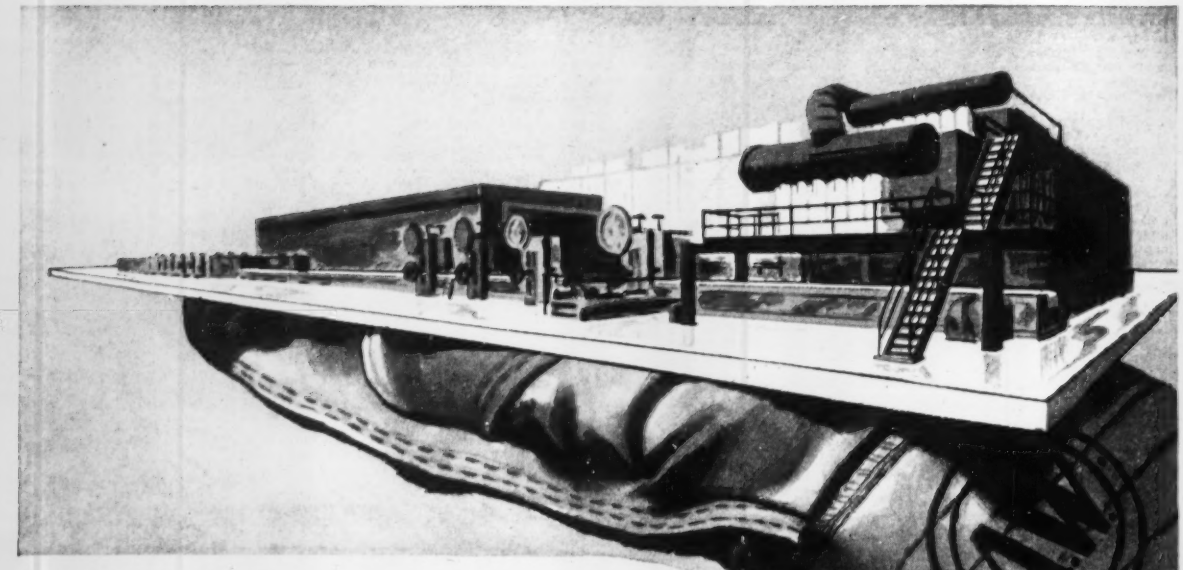
Youngstown, strip except Types 303, 309, 316, 416, 501 and 502 and 34.25c on Type 301 C8.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge iron:	Cents
98+% Fe, annealed	18.00
Unannealed	14.50
Swedish, c.i.f. N.Y., c.l., in bags	10.90
Electrolytic iron:	
Annealed, 99.5% Fe	42.50
Unannealed (99+% Fe)	36.50
Unannealed (99+% Fe) (minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Carlots, freight allowed	31.00
Atomized, 500 lb drums, freight allowed	33.00
Antimony, 500 lb lots	71.00
Brass, 20-ton lots	31.00-34.25
Bronze, 10-ton lots	51.25-60.00
Phosphor-Copper, 20-ton lots	50.00
Copper:	
Electrolytic	37.25
Reduced	35.25
Lead	7.50*
Magnesium	75.00-85.00
Manganese:	
Minus 100 mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	86.00
Nickel-Silver 5-ton lots	46.00
Silicon	38.50
Solder	8.50*
Stainless Steel, 302	83.00
Zinc, 10-ton lots	18.00-31.00
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	5.85
Less than 1000 lb	6.00
Molybdenum:	
99.9%, minus 200 mesh	3.24
Chromium, electrolytic 99.9% Cr min.	3.50

* Plus cost of metal



ALAN WOOD'S 30" STRIP MILL SERVING YOU SINCE JANUARY 2, 1950

• The Alan Wood 30" continuous mill continues to produce at top speed plates, sheets and strip.

Everything possible is being done to improve our facilities and to expedite production to give you the best possible service.

Remember, too, that Alan Wood's mine-to-mill integrated production line assures you of high grade steel.

Over A Century and a Quarter of Iron and Steel Making Experience

ALAN WOOD STEEL COMPANY

Conshohocken, Pennsylvania

IVY ROCK, PA. • SWEDELAND, PA. • DOVER, N. J. • OXFORD, N. J.

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents, Philadelphia, 25 cents; Birmingham, Cincinnati, San Francisco, St. Paul, 15 cents.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††		Carbon	Floor
Baltimore	5.81	7.17	8.32	6.42	...	6.41	7.18	11.17	6.47	6.47	7.70
Boston	6.51	7.36	8.49	6.55	...	6.42	7.47	11.18	6.56	6.75	7.98
Buffalo	5.80	6.65	8.41	6.21	...	5.90	6.95	11.07	6.08	6.30	7.67
Birmingham	5.80	6.65	7.70[2]	5.80	...	5.80	8.65	...	5.95	6.10	8.65
Chicago	5.80	6.65	7.95	5.83	...	5.83	6.56	10.65	5.95	5.95	7.18
Cincinnati	6.08	6.67	8.21	6.09	...	6.08	7.11	11.02	6.37	6.42	7.55
Cleveland	5.80	6.65	8.09	6.00	...	5.89	6.90	10.79	6.28	6.12	7.51
Detroit	6.23	6.46	8.44	6.08	7.495	6.12	7.10	10.92	6.42	6.47	7.52
Houston	6.74	...	8.67	6.89	...	6.98	...	...	6.82	6.78	8.16
Jersey City, N.J.	6.26	7.27	8.32	6.56	...	6.59	7.53	9.34	6.39	6.60	8.01
Los Angeles	6.60	8.45	9.55	6.75	11.20	6.60	8.35	12.05	6.60	6.65	8.90
Milwaukee	5.97	6.82	8.12	6.00	...	6.00	6.83	10.82	6.12	6.12	7.35
Moline, Ill.	6.16	7.00	8.30	6.19	...	6.18	6.91	...	6.30	6.30	...
New York	6.26	7.37	8.32	6.56	...	6.69	7.63	11.14	6.49	6.70	8.11
Norfolk, Va.	7.60	...	...	...	...	6.44	8.70	...	7.25	6.64	7.33
Philadelphia	6.16	7.18	7.70	6.50	8.30	6.47	7.50	10.89	6.22	6.29	7.42
Pittsburgh	5.80	6.65	7.95	5.94	...	5.83	6.90	10.65	5.95	5.95	7.18
Portland, Oreg.	7.80	9.05	9.75	7.60	...	7.35	9.40	...	7.30	7.30	9.25
Richmond, Va.	6.14	6.95	8.68	6.53	...	6.30	7.63	...	6.58	6.68	7.80
St. Louis	6.10	6.94	8.25	6.14	...	6.13	6.96	10.95	6.35	6.40	7.58
St. Paul	6.47	7.31	8.61	6.50	...	6.49	7.32	...	6.61	6.61	7.84
San Francisco	6.85	8.15	9.45	6.70	...	6.60	8.40	12.00	6.45	6.70	8.85
Seattle-Tacoma	7.16	8.24	9.30	7.45	...	6.88	9.37	11.90§	6.63	7.04	8.90
Spokane (city)	7.80	9.40	10.66	7.65	...	7.10	9.70	11.90	7.00	7.10	9.15
Washington	6.31	7.61	8.90	6.89	...	6.90	8.03	...	6.93	6.95	8.17

Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes 25-cent special bar quality extra; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [2]—500 to 1499 lb; [5]—1000 to 1999 lb.

Ores

Lake Superior Iron Ore

(Prices effective for ore delivered up to and including June 30, 1953; gross ton, 51.50% iron natural; rail or vessel, lower lake ports.)

Old range bessemer	$10.10
Old range nonbessemer	9.95
Mesabi bessemer	9.85
Mesabi nonbessemer	9.70
Open hearth lump	10.95
High phosphorus	9.70

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect on Dec. 31, 1952, and increases or decreases after such date for buyer's account.

Eastern Local Iron Ore

Cents per unit del. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	22.00
North African hematites (spot)	26.00-28.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-1.21 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 90¢-93c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$40.00-$42.00
48% 3:1	44.00-46.00
48% no ratio	32.00-34.00
South African Transvaal	
44% no ratio	$27.00-$28.00
48% no ratio	34.00-35.00
Brazilian	
44% 2.5:1 lump	nom. $32
Domestic	
(Rail nearest seller)	
48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb. molybdenum content, mines	$1.00

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l., packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr, 67-72%) Contract, carload, lump, bulk, max. 0.03% C 37.60c per lb contained Cr, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr, 62-66%, C 5-7%) Contract, c.l. S.M.x D, bulk, 26.25c per lb of contained Cr, C.l., packed 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract, carload, packed, S.M.x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-48%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 25.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 25.90c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 26-30%, Al 7-9%, C 0.05% max.) 25.75c per lb of contained silicon plus 16.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe) contract carload, 1" x D; packed, max 0.50% C grade, $1.12 per lb of contained chromium ton lot $1.14, less ton $1.16. Delivered. Spot, add 5c; prices on 0.10 per cent carbon grade, up 4c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si; packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 97% Si and 1% max Fe) c.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max. 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 20 to 1999 lb 11.65c, smaller lots 12.15c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V, 35-55%, Si 8-12% max, C 3-35% max). Contract, any quantity, $3.10 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max), $3.20. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.30.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 56c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.25 per lb contained V_2O_5, freight allowed. Spot, add 5c.

BORON ALLOYS

Ferroboron: B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max. Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa.,...prices, 100 lb and over, are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y. freight allowed same as high-carbon ferrotitanium.

TUNGSTEN ALLOYS*

Ferrotungsten: (70-80%), 10,000 lb W or more, $4.85 per lb of contained W; 2000 lb W to 10,000 lb W, $4.95; less than 2000 lb W, $5.07, f.o.b. Niagara Falls, N. Y.

*Government ceiling prices, effective May 7, 1951, f.o.b. Niagara Falls, N. Y., basis.

NOTE: Current prices on manganese, titanium and "other ferroalloys" appeared on page 183 Mar. 16 issue; calcium, zirconium, briquetted alloys and refractories, page 183 Mar. 9.

IRON AND STEEL SCRAP

Open market prices as reported to STEEL, Mar. 19, 1963, gross tons, except as noted. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Mar. 19	$44.17
Mar. 12	43.17
Feb. 1953	43.00
Mar., 1952	43.00
Mar., 1948	40.21

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH
(Including brokers' commission)

No. 1 heavy melting	44.00*
No. 2 heavy melting	44.00*
No. 1 bundles	45.00*
No. 2 bundles	42.00*
No. 1 bushelling	44.00*
Machine shop turnings	30.00-31.00*
Mixed borings, turnings	36.00-37.00*
Short shovel turnings	36.00-37.00*
Cast iron borings	36.00-37.00*
Cut structurals	40.00-41.00*
Heavy turnings	44.00*
Punchings & plate scrap	40.00-46.50*
Electric furnace bundles	46.00*

Cast Iron Grades
(Delivered)

No. 1 cupola	47.00-48.00
Charging box cast	45.00-46.00
Heavy breakable cast	44.00-44.00
Unstripped motor blocks	43.00-44.00
No. 1 machinery cast	51.00-52.00

Railroad Scrap

No. 1 R.R. heavy melt	47.00-48.00
Rails, 2-ft. and under	56.00-57.00
Rails, 18-in. and under	*58.00-59.00*
Rails, random lengths	*51.00-52.00*
Railroad specialties	*55.50-56.50*

*Plus applicable freight spring-boards from other areas.

CLEVELAND
(Delivered consumer plant, including broker's commission)

No. 1 heavy melting	44.00-44.50*
No. 2 heavy melting	43.00-43.50*
No. 1 bundles	44.00-44.50*
No. 2 bundles	42.00-42.50
No. 1 bushelling	44.00-44.50*
Machine shop turnings	*30.00-31.00*
Mixed borings, turnings	34.50-35.00*
Short shovel turnings	34.50-35.00*
Cast iron borings	34.50-35.00*
Low phos.	48.00-50.00*
Alloy free, short shovel turnings	37.00-38.00*
Electric furnace bundles	46.00-46.50*

Cast Iron Grades

No. 1 cupola	*47.00-48.00*
Charging box cast	*46.00-47.00*
Stove plate	*45.00-46.00*
Heavy breakable cast	*44.00-45.00*
Unstripped motor blocks	38.00-38.50
Brake shoes	*40.00-41.00*
Clean auto cast	52.00
No. 1 wheels	*46.00-47.00*
Burnt cast	*40.00-41.00*
Drop broken machinery	*49.00*

Railroad Scrap

No. 1 R.R. heavy melt	46.00-47.00
R.R. Malleable	50.00-51.00
Rails, 2-ft. and under	*58.00-60.00*
Rails, 18-in. and under	*61.00-62.00*
Rails, random lengths	*56.00*
Cast steel	51.00-52.00
Railroad specialties	51.00-52.00
Cast tires	*52.00-53.00*
Angles, splice bars	*54.00-55.00*
Rails, rerolling	*56.00*

*Plus applicable freight spring-boards from other districts.

NEW YORK
(Brokers' Buying Prices)

No. 1 heavy melting	*nominal*
No. 2 heavy melting	34.50
Machine shop turnings	24.50
Mixed borings, short turnings	29.50
Low phos. (structural & plate)	41.50-42.00
Shovel turnings	29.50

Cast Iron Grades

No. 1 cupola	49.00
Unstripped motor blocks	32.00-33.00

PHILADELPHIA
(Delivered consumer plant)

No. 1 heavy melting	*46.00*
No. 2 heavy melting	*45.00*
No. 1 bundles	*46.00-47.00*
No. 2 bundles	*41.00*
No. 1 bushelling	*46.00*
Machine shop turnings	32.50-33.50
Mixed borings, turnings	36.50-37.50
Short shovel turning	36.50-37.50
Structurals & plate	*49.00-50.00*
Heavy turnings	*46.00*
Couplers, springs, axles	*52.00*

Cast Iron Grades

No. 1 cupola	*45.00-47.00*
Charging box cast	45.00
Heavy breakable cast	*46.50*
Unstripped motor blocks	37.00-38.00
Drop broken machinery	50.00-51.00

CINCINNATI
(F.o.b. shipping point)

No. 1 heavy melting	*41.35*
No. 2 heavy melting	41.35
No. 1 bundles	42.35
No. 2 bundles	41.35
No. 1 bushelling	*42.35*
Machine shop turnings	32.35
Mixed borings, turnings	36.35
Short shovel turnings	36.35
Cast iron borings	36.35
Structural & plate, 1 ft.	48.35

Cast Iron Grades

No. 1 cupola	46.00
Charging box cast	*45.00*
Stove plate	*47.00*
Burnt cast	*41.00*
Heavy breakable cast	*48.00-50.00*
Unstripped motor blocks	43.00
Brake shoes	41.00
Clean auto cast	52.00
Drop broken machinery	49.00-50.00

Railroad Scrap

No. 1 R.R. heavy melt	45.00
Malleable	55.00
Rails, 18-in. and under	*60.00-62.00*
Rails, random lengths	*52.00-53.00*
Rails, rerolling	52.00

DETROIT

No. 1 heavy melting	39.00-40.00
No. 2 heavy melting	38.00-39.00
No. 1 bundles	40.00-41.00
No. 2 bundles	37.00-38.00
No. 1 bushelling	40.00-41.00
Machine shop turnings	*24.50-25.00*
Mixed borings, turnings	27.00-27.50
Short shovel turnings	27.00-27.50
Punchings & plate scrap	44.00-46.00

Cast Iron Grades

No. 1 cupola	47.50
Charging box cast	40.00-42.00
Stove plate	*43.00-44.00*
Unstripped motor blocks	*33.00*
Clean auto cast	50.00
Malleable	48.00

BUFFALO

No. 1 heavy melting	$45.00-46.00
No. 2 heavy melting	42.00-43.00
No. 2 bundles	42.00-43.00
No. 1 bundles	43.00-44.00
No. 1 bushelling	43.00-44.00
Machine shop turnings	32.50-33.00
Mixed borings, turnings	36.50-37.00
Short shovel turnings	36.50-37.00
Low phos.	48.50-49.00

Cast Iron Grades
(F.o.b. Shipping Point)

No. 1 cupola	42.50-43.00
Drop broken machinery	45.50-46.00

BOSTON
(Brokers' Buying Prices; f.o.b. shipping points)

No. 1 heavy melting	34.17
No. 2 heavy melting	31.17
No. 1 bundles	*34.17*
No. 2 bundles	31.17
Machine shop turnings	*22.17-24.17*
Mixed borings, turnings	22.17
Short shovel turnings	*26.17-27.17*
No. 1 cast	*44.00-45.00*
Mixed cupola cast	32.00-33.00
No. 1 machinery cast	*46.00-47.00*

CHICAGO
(Including broker's commission)

No. 1 heavy melting	42.50*
No. 2 heavy melting	40.50*
No. 1 bundles	43.50*
No. 2 bundles	39.00*
No. 1 bushelling	43.50*
Machine shop turnings	29.00-30.00*
Mixed borings, turnings	*29.00-30.00**
Short shovel turnings	*31.00-32.00**
Cast iron borings	*29.00-30.00**
Cut structurals	46.50*
Heavy turnings	43.50*
Electric furnace bundles	45.50*

Cast Iron Grades

No. 1 cupola	43.00-45.00
Stove plate	42.00-43.00
Unstripped motor blocks	38.00-40.00
Clean auto cast	48.00-50.00
Drop broken machinery	46.00-48.00

Railroad Scrap

No. 1 R.R. heavy melt	46.00-48.00
R.R. Malleable	46.00-48.00
Rails, 2-ft. and under	53.00-55.00
Rails, 18-in. and under	55.00-57.00
Angles, splice bars	52.00-54.00
Rails, rerolling	*55.00-57.00*

*Plus applicable freight spring-boards from other areas.

BIRMINGHAM

No. 1 heavy melting	39.00-40.00
No. 2 heavy melting	38.00-39.00
No. 1 bundles	39.00-40.00
No. 2 bundles	36.00-37.00
No. 2 bushelling	35.00-36.00
Machine shop turnings	28.00-29.00
Mixed borings, turnings	31.50-32.50
Short shovel turnings	31.50-32.50
Cast iron borings	31.50-32.50
Cut structurals	43.00-44.00
Heavy turnings	38.00
Punchings & plate scrap	41.50
Electric furnace bundles	41.00

Cast Iron Grades
(F.o.b. Shipping Point)

No. 1 cupola	43.00-44.00
Charging box cast	39.00-40.00
Stove plate	38.00-39.00
Heavy breakable cast	36.00-37.00
Unstripped motor blocks	35.00-36.00
Brake shoes	41.00
Clean auto cast	52.00
No. 1 wheels	47.00
Burnt cast	41.00
Drop broken machinery	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt	41.00
Malleable	55.00
Rails, 2-ft. and under	46.00
Rails, 18-in. and under	49.00
Rails, random lengths	49.00-51.00
Cast steel	41.00
Uncut tires	43.00
Angles, splice bars	46.00
Rails, rerolling	48.00

ST. LOUIS
(Brokers' Buying Prices)

No. 1 heavy melting	40.00
No. 2 heavy melting	40.00
Machine shop turnings	28.00
Short shovel turnings	32.00

Cast Iron Grades

No. 1 cupola	43.00-45.00
Charging box cast	39.00-41.00
Heavy breakable cast	36.00-38.00
Unstripped motor blocks	33.00-35.00
Brake shoes	41.00
Clean auto cast	46.00-47.00
Burnt cast	37.00-39.00

Railroad Scrap

Malleable	40.00
Rails, 18 inch and under	*60.00-62.00*
Rails, random lengths	52.00-54.00
Uncut tires	48.00
Angles, splice bars	49.00
Rails, rerolling	50.00-52.00

SEATTLE
(Delivered consumer plant)

No. 1 heavy melting	*30.00*
No. 2 heavy melting	*26.00*
No. 1 bundles	*29.00*
No. 2 bundles	*24.00*
Machine shop turnings	*15.00*
Mixed borings, turnings	*15.00*
Short shovel turnings	*15.00*
Electric furnace, No. 1	40.41

Cast Iron Grades
(F.o.b. Shipping Point)

No. 1 cupola	40.00
Heavy breakable cast	36.00-38.00
Unstripped motor blocks	28.41
No. 1 wheels	47.00

Railroad Scrap

Rails, random lengths	38.41

SAN FRANCISCO

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	29.00
No. 2 bundles	24.00
No. 1 bushelling	30.00
Machine shop turnings	12.00
Mixed borings, turnings	29.00
Short shovel turnings	29.00
Cast iron borings	29.00
Cut structurals	38.00
Heavy turnings	34.00
Punchings & plate scrap	37.50
Electric furnace bundles	37.00

Cast Iron Grades

No. 1 cupola	37.50
Charging box cast	47.00
Stove plate	46.00
Heavy breakable cast	45.00
Unstripped motor blocks	41.00
Brake shoes	41.00
Clean auto cast	52.00
No. 1 wheels	47.00
Burnt cast	41.00
Drop broken machinery	52.00

Railroad Scrap

No. 1 R.R. heavy melt	37.00
Malleable	55.00
Rails, 3-ft. and under	42.00
Rails, 18-in. and under	45.00
Rails, random lengths	39.00
Cast steel	40.00
Uncut tires	39.00
Angles, splice bars	42.00
Rails, rerolling	44.00

LOS ANGELES

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	29.00
No. 2 bundles	24.00
Machine shop turnings	12.00

Cast Iron Grades
(F.o.b. Shipping Point)

No. 1 cupola	*58.00-61.00*

HAMILTON, ONT.
(Delivered Prices)

Heavy Melt	$35.50
No. 1 Bundles	35.50
No. 2 Bundles	35.50
Mechanical Bundles	31.50
Mixed Steel Scrap	31.50
Mixed Borings, Turnings	28.50
Rails, Remelting	35.50
Rails, Rerolling	38.50
Bushelling	28.00
Bushelling, new factory Prep'd	33.50
Unprep'd	31.50
Short Steel Turnings	28.50

Cast Iron Grades†

No. 1 Machinery Cast	50.00

†F.o.b. shipping point.

OLD CEILING BASE PRICES

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

Grade 1 Basing Point	No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

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WHEN A CONTAINER is full, the Dempster-Dumpster picks it up, hauls it to destination and dumps the materials or sets the load down intact. These three simple operations, shown above, are hydraulically controlled by driver in truck cab.

DEMPSTER BROTHERS, 633 Dempster Bldg., Knoxville 17, Tennessee

The Metal Market

Watch for a decline in copper prices. Growing number of buyers demand downward price protection on future deliveries. Only a few are fearful of an advance

COPPER PRICES are still at flood level but should start to recede in about a month.

This belief among market men is reinforced by the growing number of buyers demanding downward price protection on future deliveries. Few are concerned about a possible advance in price; they feel momentum has been lost. One copper expert goes so far as to say that supply and demand are in balance today or perhaps even a surplus exists and that today's frantic scrambling stems mainly from distortions caused by controls. The distinct easing in demand outside the U. S. and the increase in supplies resulting from price decontrol will be felt soon.

Watch Scrap—A number of factors support the easing-by-summer theory. One is that scrap is again flowing in volume and through the usual channels at a price below the comparative cost of refined copper. No. 2 copper, which requires about 90 days for refining, is one tip-off on trade thinking.

Price of that grade plus cost of conversion equals a selling price after refining of about 31.50 cents, as against 33 to 34 for delivery today. Scrap is pouring forth strongly too. February output of secondary copper 8134 tons was highest since August, 1950, and much of the month was under controls. Buying frenzy has subsided too; most custom smelters try to balance daily intake with sales of refined metal to avoid building stocks of high-cost scrap.

Insurance — Interest in foreign metal doesn't extend beyond May, even though the word's getting around that all allocations will cease after April. Some foreign copper has been contracted for through April at 34 to 36 cents and a little at 34 cents for May delivery. No one is willing to pay even 32 cents for July-August copper at this time. One device used to protect against a fast fall-off is to pay the average price for the month *after* month of delivery.

Sellers of domestic copper still charge price on date of shipment; dealers will offer firm prices for those who want to hedge. Domestic quotations range from 27.50 to 34.00 cents, with nearly as many prices as suppliers. Fabricators' statistical departments have full-time job trying to figure cost of raw materials.

NEW TWIST IN COPPER
. . . as many prices as suppliers

Aluminum Outlook Brightens

Enough aluminum will be available in 1953 to meet all defense needs and allow civilian consumption one-third higher than last year, says Office of Defense Mobilization. Stockpiling will be resumed on a quarterly basis but at no higher a rate than previously outlined. The 1.75 million tons ODM calculates will be available for civilian consumption will come from new plants, higher imports (nearly 200,000 tons), further diversions from slack European markets, and greater output from existing plants with good weather.

Outlook for Tin

Tin output in the free world should approach 175,000 to 180,000 long tons if prices are maintained at or near present levels, says the Malayan Tin Bureau. Production in 1952 was 167,100 tons, and consumption 128,000 tons, according to reports by the International Tin Study Group.

MTB estimates U. S. industry will buy 75,000 tons of tin in 1953 for consumption and stock replenishment. A less optimistic forecast comes from C. A. Ilgenfritz of U. S. Steel Corp. In the bulletin of the National Association of Purchasing Agents, he notes, "The present price of tin does not encourage its free and unlimited use. Tin at $1.215 is not going to be used if anything cheaper can be found to do the job." He believes any increase in tin consumption attributable to removal of end-use restrictions will be limited to a comparatively insignificant tonnage.

Stockpiling Braces Zinc

Zinc got a welcome but brief respite from price cutting when General Services Administration entered the market for tonnages estimated at from 10,000 to 25,000 tons. Effect on the market was slight but it did boost morale of the industry, and indicated the government is worried about falling price and production. Lead continued in status quo, but buyers appear to be readying spring orders that should firm the market quickly.

Decontrol Cost 5 Per Cent

Cost of price decontrol on raw material: About 5 per cent since the first order went out, says Price Stabilizer Joseph Freehill. Top rise is copper scrap with a 40 per cent advance, and in second place is aluminum scrap, up 35 per cent. The figure is expected to inch up slightly after release of price reins on remaining industrial materials last week. Included in the batch were monel, inconel and nickel shapes and mill products, columbium, tantalum, molybdenum, and beryllium and its alloys. These alloying materials are all in critical supply.

Nonferrous Briefs

Canadian aluminum mill deliveries have tightened to about 20 weeks, but those in the U. S. are longer still.

Offerings of Japanese silver at discounts up to a half-cent are current.

Discovery of extensive nickel deposits in Manitoba have been reported to the Canadian government.

Nearly 10,000 tons of copper have been lost through a strike at Anaconda's Chuquicamata, Chile, mine.

Stainless and alloy steel took 42 per cent of nickel consumed last year, nonferrous alloys 32 per cent, high temperature and resistance alloys 8 per cent, castings and miscellaneous uses 18 per cent.

Quantitative limitations on copper scrap allocations will be discontinued but each consumer will be limited to grade or type he normally buys.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 27.50c-34.00c, Conn. Valley; Lake 32.12½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 29.50c; 88-10-2 (No. 215) 41.75c; 80-10-10 (No. 305) 35.00c; No. 1 yellow (No. 405) 24.00c.

Zinc: Prime western 11.00c; brass special 11.25c, intermediate 11.50c; East St. Louis; high grade 12.35c, and special high grade 12.50c, delivered.

Lead: Common 13.30c; chemical 13.40c; corroding, 13.40c, St. Louis.

Primary Aluminum: 99% plus, ingots 20.50c, pigs 19.50c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 23.50-24.50; No. 12 foundry alloy (No. 2 grade) 22.75-23.25; steel deoxidizing grades; notch bars, granulated or shot: Grade 1, 23.00-24.00; grade 2, 22.50-23.50; grade 3, 21.75-22.25; grade 4, 22.00-22.50.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 27.00c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 121.50c.

Antimony: American 99-99.8% and over but not meeting specifications below 34.50c; 99.8% and over (arsenic 0.05% max., other impurities 0.1% max.) 35.00c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 60.00c; 25-lb pigs, 62.65c; "XX" nickel shot, 63.65c; "F" nickel shot or ingots, for addition to cast iron, 60.00c. Prices include import duty.

Mercury: Open market, spot, New York, $195-$200 per 76-lb flask.

Beryllium Copper: 3.75-4.25% Be, $37.72 per lb of contained beryllium, f.o.b. Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2 del; special or patented shapes, $2.15.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 85.25c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $23-$24 per troy ounce.

Iridium: $175-185 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Cents per pound, f.o.b. mill, effective Feb. 27, 1953. Listings are lowest quotations.)

Sheet: Copper 48.58; yellow brass 42.03; commercial bronze, 95% 48.49; 90% 47.46; red brass, 85% 45.91; 80% 44.89; best quality, 43.06; nickel silver, 18%, 58.52; phosphor-bronze grade A, 5%, 68.57.

Rod: Copper, hot-rolled 45.33; cold-drawn 46.83; yellow brass free cutting, 35.92; commercial bronze 95% 48.18; 90% 47.15; red brass 85% 45.60; 80% 44.58.

Seamless Tubing: Copper 48.92; yellow brass 44.34; commercial bronze, 90%, 50.02; red brass, 85%, 48.72.

Wire: Yellow brass 42.32; commercial bronze, 95% 48.78; 90% 47.75; red brass, 85%, 46.20; 80% 45.18; best quality brass, 43.78. (Base prices effective Mar. 3, 1953.)

Copper Wire: Bare, soft, f.o.b. eastern mills, 100,000 lb lots 36.01; 30,000 lb lots 36.17; l.c.l. 36.67. Weatherproof, 100,000 lb 36.75; 30,000 lb 37.00; l.c.l. 37.50. Magnet wire, del. 15,000 lb or more 42.42; l.c.l. 42.23.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders. Effective Jan. 22, 1953.)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	32.9	...	...
0.135-0.096	12-48	33.4	...	...
0.095-0.077	12-48	34.1	31.8	36.3
0.076-0.061	12-48	34.7	32.0	36.5
0.060-0.048	12-48	35.0	32.2	36.8
0.047-0.038	12-48	35.5	32.6	37.1
0.037-0.030	12-48	35.9	33.0	37.8
0.029-0.024	12-48	36.5	33.3	38.3
0.023-0.019	12-36	37.1	34.0	39.0
0.018-0.017	12-36	37.9	34.6	39.9
0.016-0.015	12-36	38.8	35.4	41.1
0.014	12-24	39.8	36.4	42.4
0.013-0.012	12-24	40.9	37.1	43.4
0.011	12-24	41.9	38.3	45.0
0.010-0.0095	12-24	43.1	39.4	46.6
0.009-0.0085	12-24	44.3	40.7	48.5
0.008-0.0075	12-24	45.8	41.9	50.3
0.007	12-18	47.3	43.4	52.6
0.006	12-18	48.9	44.8	57.6

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (In.) or distance across flats	—Round— 17S-T4	Hexagonal 17S-T4
0.125	56.8	...
0.156-0.0188	48.0	...
0.219-0.313	45.3	...
0.375	43.7	52.4
0.406	43.7	...
0.438	43.7	52.4
0.469	43.7	...
0.500	43.7	52.4
0.531	43.7	...
0.563	43.7	49.2
0.594	43.7	...
0.625	43.7	49.2
0.688	43.7	49.2
0.750-1.000	42.6	46.4
1.063	42.6	44.8
1.125-1.500	41.0	44.8
1.563	40.5	...
1.625	39.8	43.2
1.688-2.000	39.8	...

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $18.00 per cwt; add 50c cwt 100 sq ft to 140 sq ft. Pipe: Full coils $18.00 per cwt. Traps and bends: List prices plus 43%.

ZINC

Sheets 23.00c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 20.75-21.75c; over 12-in., 20.75-21.75c.

"A" NICKEL

(Base prices f.o.b. mill, effective Mar. 9, 1953.) Sheets, cold-rolled 86.50c. Strip, cold-rolled 92.50c. Rods and shapes, 82.50c. Plates, 84.50c. Seamless tubes 115.50c.

MONEL

(Base prices f.o.b. mill, effective Mar. 9, 1953.) Sheets, cold-rolled 67.50c. Strip, cold-rolled 70.50c. Rods and shapes, 65.50c. Plates 66.50c. Seamless tubes, 100.50c. Shot and blocks, 57.00c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb 58.00-65.00c; 25 to 99 lb 48.00-54.00c; 100 lb to 5000 lb, 44.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 42.18c; oval 41.68c.

Nickel Anodes: Rolled oval, carbonized, carloads, 78.00c; 10,000 to 30,000 lb 79.00c; 3000 to 10,000 lb 80.00c; 500 to 3000 lb 81.00c; 100 to 500 lb, 83.00c; under 100 lb, 86.00c; f.o.b. Cleveland.

Nickel Chloride: 37.35c in 100 lb bags, 1 to 3 bags; 3 to 99 bags 35.35c; 34.85c over 10,000 lb, f.o.b. Cleveland, freight allowed on 300 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers $1.10 per lb; 100 or 350 lb drums only, 100 to 600 lb 71.60c; 700 to 1900 lb, 69c; 2000 to 6000 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.42; 500 to 999 lb, $1.425; 200 to 499 lb, $1.43; less than 200 lb, $1.445. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb, $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, $1.25; 100 lb kegs $1.26, f.o.b. Carteret, N. J., freight allowed on 100 lb or more.

Scrap Metals

Brass Mill Allowances

(Prices in cents per pound for less than 15,000 pounds, f.o.b. shipping point. Listings are lowest quotations.)

	Clean Heavy	Rod Ends	Clean Turnings
Copper	27.125	27.125	26.375
Yellow Brass	26.625	26.375	19.500
Commercial Bronze 95%	25.750	25.500	25.000
90%	24.875	24.625	24.125
Red Brass 85%	24.000	23.750	23.250
80%	23.000	22.750	22.250
Best Quality(71-80%)	21.500	21.250	20.750
Muntz metal	19.375	19.125	18.625
Nickel silver, 10%	24.375	24.125	23.1875
Phos. Bronze, A	29.125	28.875	27.875
Naval Brass	19.25	19.00	18.50
Manganese Bronze	19.25	19.00	18.50

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 28.50; No. 2 copper 26.50; light copper 25.00; refinery brass (60% copper) per dry copper content 25.00.

Beryllium copper: Heavy scrap, .020-in. and heavier, not less than 1.5% beryllium, 42.00; light scrap, 37.00; heavy and light scrap mixed, 37.00; heavy scrap, less than 1.50% but more than 0.40% beryllium, 34.00; light scrap, less than 1.50% but more than 0.40% beryllium, 30.00; heavy and light scrap mixed, less than 1.50% but more than 0.40% beryllium 30.00. Freight allowed on shipments of 200 lbs or more east of Mississippi river; from points west of Mississippi freight allowed up to maximum of $2 per cwt.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 25.50-26.00; No. 2 24.50-24.00; light copper 22.00-22.50; No. 1 composition red brass 19.00; No. 1 composition turnings 18.50; mixed brass turnings 13.50; new brass clippings 18.50; No. 1 brass rod turnings 17.00; light brass 12.50; heavy yellow brass 14.50; new brass rod ends 17.50; auto radiators, unsweated 15.00; cocks and faucets 16.50; brass pipe 17.50.

Aluminum: Clippings 28 13.00; old sheets 10.00; crankcase 10.00; borings and turnings 8.00; pistons and struts 6.50.

Tin: No. 1 pewter 70.00; block tin pipe 100.00; No. 1 babbitt 60.00.

Lead: Heavy 10.25-10.75; battery plates 5.25-5.50; linotype and stereotype 12.00-12.50; electrotype 9.25-10.75; mixed babbitt 12.50-13.50.

Zinc: Old zinc, 5.00; new die cast scrap, 5.00; old die cast scrap, 4.00.

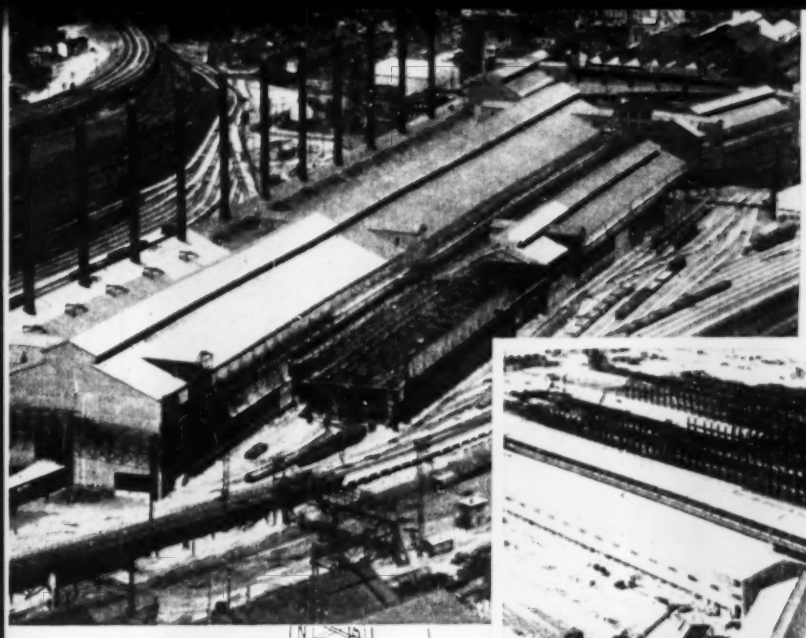
Nickel: Sheets and clips 58.00-60.00; rolled anodes 58.00-60.00; turnings 55.00; rod ends 58.00-60.00.

Monel: Clippings 33.00; old sheet 30.00; turnings 25.00; rods 33.00.

DAILY PRICE RECORD

1953	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Mar. 13-19	27.50-31.00	13.30	11.00	121.50	20.50	34.50	60.00	85.25
Mar. 11-12	27.50-33.00	13.30	11.00	121.50	20.50	34.50	60.00	85.25
Mar. 2-10	27.50-32.00	13.30	11.00	121.50	20.50	34.50	60.00	85.25
Feb. 25-28	27.50-28.50	13.30	11.25	121.50	20.50	34.50	60.00	85.25
Feb. 3-24	24.50	13.30	11.50	121.50	20.50	34.50	60.00	85.25
Feb. 2	24.50	13.30	12.00	121.50	20.50	34.50	60.00	85.25
Jan. 27-31	24.50	13.80	12.00	121.50	20.50	34.50	60.00	85.25
Jan. 22-26	24.50	13.80	12.50	121.50	20.50	34.50	60.00	85.25
Jan. 16-21	24.50	13.80	12.50	121.50	20.00	34.50	60.00	85.25
Jan. 15	24.50	13.80	12.50	121.50	20.00	34.50	60.00	84.75
Jan. 14	24.50	13.80	12.50	121.50	20.00	34.50	60.00	84.25
Jan. 13	24.50	13.80	13.00	121.50	20.00	34.50	56.50	83.75
Jan. 12	24.50	13.80	13.00	121.50	20.00	34.50	56.50	83.25
Feb. 1953 Avg.	25.136	13.30	11.431	121.50	20.50	34.50	60.00	85.25
Jan. 1953 Avg.	24.50	13.838	12.596	121.50	20.173	34.50	58.654	84.442
Feb. 1952 Avg.	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin: Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9% base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.



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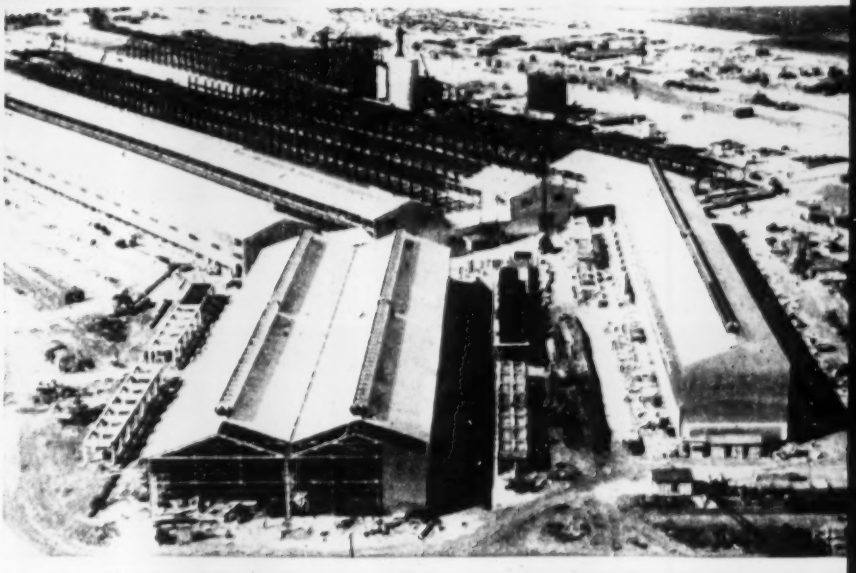
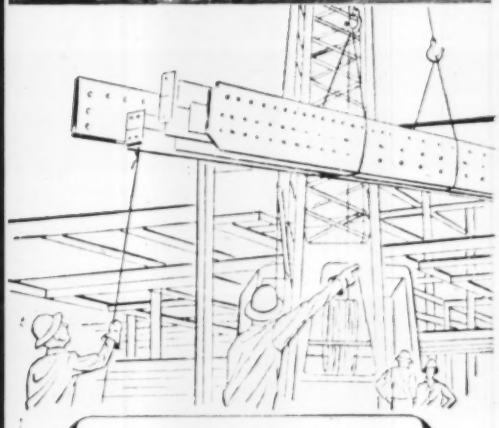
• • •

REYNOLDS METALS COMPANY, San Patricio Plant, Corpus Christi, Texas, for increased production of aluminum.





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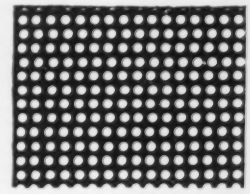

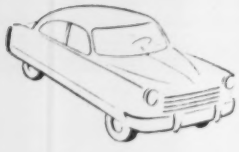

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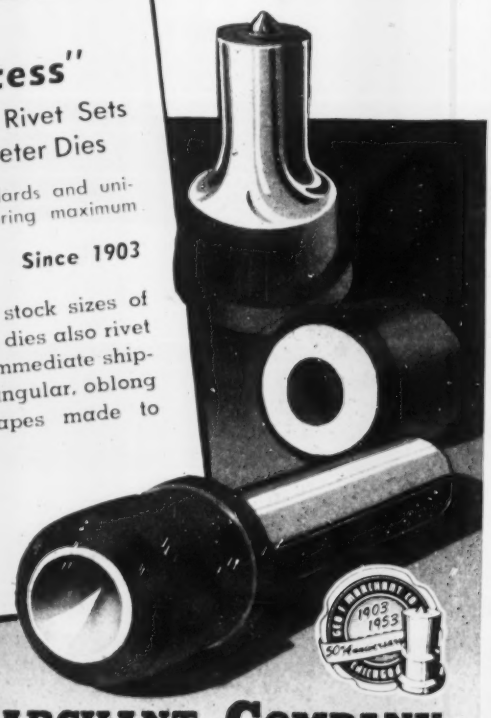

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Plates . . .

Plate Prices, Page 127

Pittsburgh—There are any number of plate consumers in this district with unplaced NPA tickets. One agricultural equipment manufacturer can't find a home for 2000 tons after combing the market thoroughly. Producers are optimistic for third quarter. They expect to fill order books just as soon as they are opened.

Boston—Although still among the products in tightest supply, demand for wide and heavy plates has subsided in some directions. There are scattered exceptions, such as weldment shops which require the high rating Z-2 to obtain heavy plates.

Increase of 3 and 2 per cent, respectively, in nickel-chromium and straight chromium stainless prices has been passed on by producers of stainless clad plates.

New York—While heavier gages are in more active demand than lighter, inquiry for the latter exceeds supply. Eastern plate mills have no tonnage available for delivery in second quarter insofar as civilian requirements are concerned.

Sheets, Strip . . .

Sheet and Strip Prices, Page 127 & 128

Cleveland — Sheetmakers report pressure for tonnage never was greater. Booked up solidly through second quarter they are turning away tonnage inquiries from commercial consumers who appear desperate for steel. Automotive and appliance industries are anxious to take in all the steel they can lay their hands on. The automotive interests not only are actively seeking conversion tonnage but they are buying imported sheets in quantity. Manufacturers of appliances also are paying premium prices to get material. Operations of one such interest reportedly are supported on a steel supply 70 per cent of which was acquired from warehouse. While hot and cold-rolled sheets are the most wanted grades, electrical sheets also are in strong demand, and a noticeable pickup in requirements for galvanized sheets is noted. Reflecting this latter situation, a warehouse that had cancelled an order for 5000 tons of galvanized sheets with a mill last December now is reported seeking tonnage.

Boston—Until the automobile industry's demand for sheets is satisfied no improvement in volume for other commercial consumers may be expected in the carbon grades. Conjecture as to when this will occur ranges from late second quarter to well into third quarter.

New York — Pressure for sheets continues strong, possibly exceeding that for any other major product. This is noticeably the case with regard to hot and cold-rolled sheets, electrical sheets and enameling stock. Even galvanized sheets are in better demand at the mill level.

Philadelphia—Sheet supply is tighter than ever, especially in the hot and cold-rolled grades, and among the specialties, electrical sheets. Some improvement is noted in galvanized sheet demands although distributors are still competing keenly for business in this line.

Pittsburgh—One producer of sheets

and strip reports demand for cold-rolled strip greater than during 1947 and 1948. Customers indicate they want to order twice as much tonnage during third quarter as they did during second quarter under government controls.

Cincinnati — Demand for hot and cold-rolled sheets is strong but galvanized sheets are moving slowly. It is thought the latter, to some extent, has been affected by the recent sharp drop in zinc prices.

Tubular Goods . . .

Tubular Goods Prices, Page 131

New York—Although spring is at hand, demand for merchant pipe is easier than it was two or three weeks ago. Distributors continue to take their full quotas as they wish to maintain their positions with the mills. However, they are offering tonnage at lower discounts in an effort to move it.

New York—The Walsh-Holyoke Division, Continental Copper & Steel Industries Inc., will fabricate a large quantity of steel pipe and equipment for two Atomic Energy Commission projects. The company has rented buildings with approximately 225,000 square feet of area at South Portland, Me., formerly occupied by the New England Shipbuilding Corp. Production is scheduled to start about May 15.

Boston—Only easy spots in tubular products are carbon lightwall tubing in smaller sizes and buttweld. Both have softened in price, tubing at mill level and pipe with distributors. The latter, with inventories in balance, are not taking full allocations and disposal of undistributed tonnage is more difficult.

Steel Bars . . .

Bar Prices, Page 127

Boston—Open bar tonnage in June schedules appears likely in smaller range of cold-rolled carbon, scattered hot-rolled and possibly alloys. In the case of the latter, warehouses are offered more than apparent needs. In part larger alloy volume stems from new sources closed during earlier more critical period. More open hearth resulphurized stock is available. Possibly affecting future alloy bar requirements is the more localized induction hardening of manganese carbon steel.

New York—Reflecting heavy demand for shell steel, hot carbon bars around 2-inches and up, are in tighter supply. Various producers now have far more high-rated tonnage on their books for second quarter than their CMP set-asides call for. This is backing up tonnage originally scheduled for commercial users.

Philadelphia—Except possibly for some sizes of cold-drawn bars, bar mills are completely out of the market on commercial tonnage.

Pittsburgh — For small diameter hot-rolled steel bars, pressure has nearly disappeared. For large diameters, the outlook is for continued tight supply into third quarter.

Cleveland—With government price control removed from steel products it would not be surprising in the trade if bar prices are adjusted upward. Producers have been maintaining right along that bars is one of

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the items on which their profit margin is slim.

Chicago—Bars under 1-inch diameter, both hot-rolled and cold-finished, are in comfortable supply. Cold-finished is aided by the fact sizes from 7/8-inch down can be drawn from wire rods which are not in critical supply. Demand for sizes over 2-inch in both hot and cold categories just can't be accommodated currently.

Tin Plate . . .

Tin Plate Prices, Page 128

Cleveland—Tin plate prices are expected to hold firmly at current levels until beginning of fourth quarter. The trade, generally, is expected to adopt similar pricing policy on tin plate as that announced early last week by the U. S. Steel Corp. which notified its customers it will continue current mill prices, extras and deductions until Sept. 30.

Pittsburgh—Following the policy established last fall, U. S. Steel Corp. made its semiannual price announcement on tin plate last week. Tin plate and other tin mill products will not be revised in price during the period from Apr. 1 to Sept. 30.

Wire . . .

Wire Prices, Page 129

New York—Openings for non-allocated wire products will be included in June schedules for the most part and volume will differ as to products. Finer sizes and limited miscellaneous low carbon wire are included.

Boston—Efforts to place open-end tonnage orders on some wire products for June are successful. Limited volume of cold-heading stock is likely to be available without tickets late next quarter. Current demand for furniture spring wire is heavy and here also users seek openings for June.

Chicago—Demand for manufacturers wire items holds steady and strong. This reflects near-capacity operations in the fastener manufacturing field which uses cold-heading and screw machine stock.

Structural Shapes . . .

Structural Shape Prices, Page 127

Boston—With needed sizes for prompt delivery, district structural fabricating shops are able to smooth out their schedules. Steel is largely imported or available in one month from premium price mills.

New York—Plans are being issued for the main section of the state thruway bridge over the Hudson River, off Rockland county, involving between 40,000 and 45,000 tons. This is in addition to the 9000 tons of beam spans for the approaches which were placed with the American Bridge Division, U. S. Steel Corp., a few weeks ago.

Philadelphia—Structural inquiry is showing more diversity. Orders remain spotty but more business appears to be in the works.

Pittsburgh—American Bridge Division, U. S. Steel Corp., has been awarded the contract for fabrication and erection of the new 41-story Mid-America home office in Chicago of Prudential Insurance Co. Approximately 31,000 tons of structural steel will be required.

Tool Steel . . .

Tool Steel Prices, Page 129

New York—Total shipments of high speed and tool steel, excluding hollow drill steel, in January were 9769 net tons, based on reports to the American Iron & Steel Institue from 19 producing companies. This was a slight decline compared with shipments of 9778 tons in December, but was down sharply from the 14,483 tons shipped in January, 1952. Shipments in all of 1952 totaled 122,220 tons, comparing with 176,014 tons in 1951.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 131

Pittsburgh—The second battery of coke ovens to be completed this year at the Clairton Works of U. S. Steel Corp., started producing coke last week. The 61 ovens of the new Koppers type use 1400 tons of coking coal to produce 966 tons of coke daily. Another battery of ovens is nearing completion and is scheduled to turn out first coke in May.

Coal operators, alarmed by shrinking industrial tonnage demands, are heartened by experiments conducted by Pittsburgh Consolidation Coal in moving powdered coal by pipeline.

Conversion Steel . . .

Chicago—Automobile manufacturers are going all-out to acquire sheets, particularly cold-rolled, by conversion arrangement. They are not able to line up much additional tonnage over present bookings. Some converters are booked into third quarter but the main push is for second quarter. There is a feeling prevailing conversion steel won't be in much demand after midyear.

Pig Iron . . .

Pig Iron Prices, Page 126

Cleveland—Merchant iron sellers are disposing of all their production but they are not being pressed for shipments like they were a year or so ago. Foundry operations have improved in spots but the castings producers are taking only such tonnage as they require to maintain comfortable inventory and sustain current production.

Chicago—Gray iron and malleable foundries serving the automotive field are extremely busy and those serving the household appliance and farm equipment fields also are comfortably engaged. This adds up to a strong demand for pig iron and sellers find it necessary to maintain customer quotas.

Boston—With the melt stabilized, except for an occasional armament contract, most consumers of foundry and malleable iron have brought inventory into balance. Stock piling by the Everett furnace has been resumed.

New York—District gray iron foundries are operating at slightly better rate. Improvement since the beginning of the year has been disappointing. Some sellers, who handle both pig iron and coke, say they see no improvement in demand for iron.

Philadelphia—The Chester, Pa.

blast furnace, operated by a subsidiary of the Barium Steel Corp., is expected to be put in blast momentarily following a suspension of about two months for reliming.

Scrap . . .

Scrap Prices, Page 134

Washington—Consumption of ferrous materials during January totaled 12,635,000 gross tons, exceeding December consumption by 261,000 tons, according to a preliminary report by the Bureau of Mines.

Purchased scrap consumption was 3,059,000 tons, increase of 86,000 over December and second highest since May 1951. Home scrap consumption totaled 3,191,000 tons, increase of 75,000 and the largest quantity ever consumed in any one month.

Stocks of purchased scrap held by consumers totaled 4,744,000 gross tons decreasing for the fourth consecutive month; home scrap stocks amounted to 1,174,000 tons, decreasing slightly for the third straight month.

Total scrap stocks at the end of the month were 7,106,000 gross tons.

Philadelphia—A more confused or more mixed situation in No. 1 heavy melting steel than now prevails has seldom, if ever, been experienced in eastern Pennsylvania. The Morrisville, Pa., consumer has been buying selected lots of No. 1 and other top grades at the equivalent of $19.48, delivered, including broker's commission. Another mill closed on 500 tons of No. 1 heavy melting steel with a nearby yard at $45, delivered, with no commission involved. Other district mills are marking time. Their attitude, especially as to No. 1 heavy melting, is to sit tight until things settle down. As a purely nominal figure, No. 1 heavy melting is quoted $46 delivered.

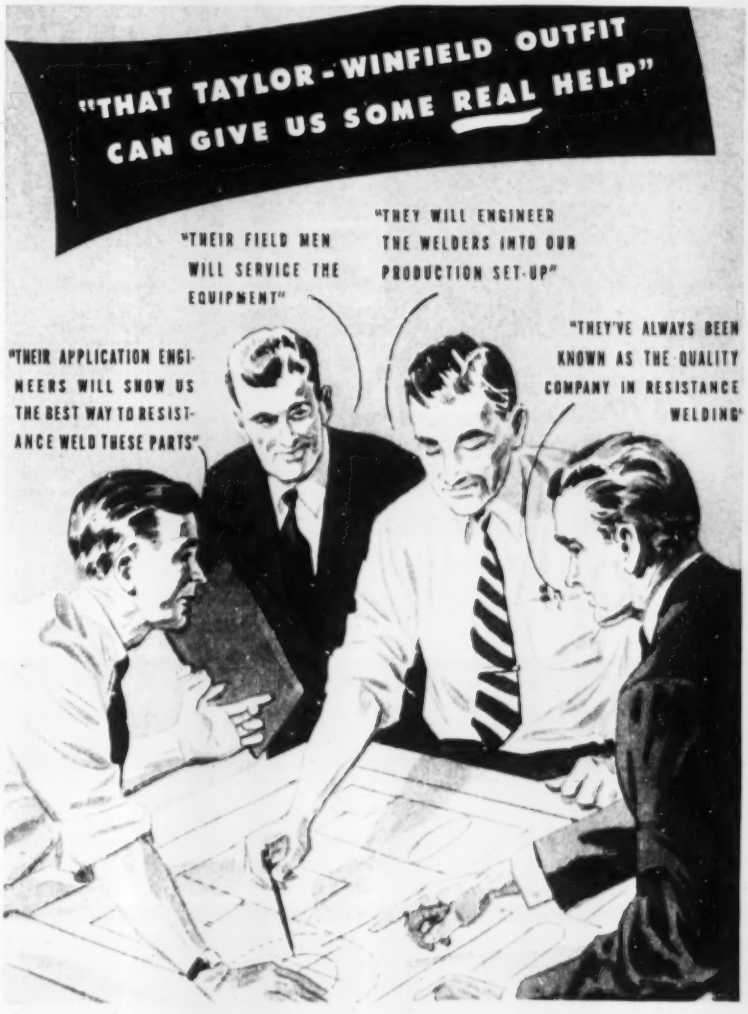
Boston—Except for selective graded lots of No. 1 heavy melting steel and No. 1 bundles, steelmaking scrap barely holds to former price ceilings while several grades, including turnings, are quoted under the old ceilings and at wider differentials. Cast remains in the doldrums with no indication of a recovery in prices. New buying of steel scrap is slack. Shafting is off $4 from the former ceiling at $40.17, shipping point. For baling material, dealers are paying around $28 and are more reluctant to build up heavier stocks in cast grades.

New York—Brokers' buying prices are unchanged with most withholding from the market on heavy melting steel until conditions settle.

Buffalo—New business in cast scrap within prevailing price ranges features the market in this area. Although tonnage moving is light, it contrasts noticeably with the recent inertia in this grade. Steelmaking scrap is marking time. Dealers are shipping against old orders, awaiting placement of new orders.

Pittsburgh—Strong, though not a boom market prevails in the better grades of scrap. As a result, prices are firm.

Detroit—Demand for scrap continues heavy in this area. Some scrap men say their business is more brisk than at any time in recent months. Anticipated softening of prices on some items is not occurring. Inquiries are being received from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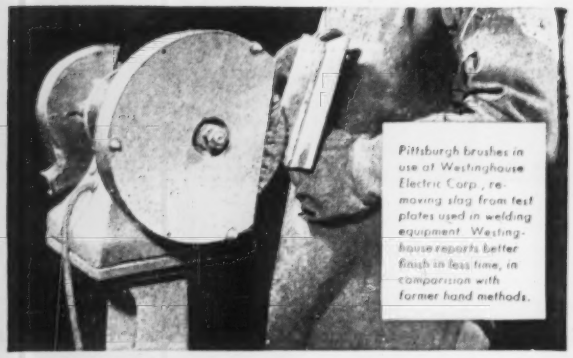

Pittsburgh brushes in use at Westinghouse Electric Corp., removing slag from test plates used in welding equipment. Westinghouse reports better finish in less time, in comparison with former hand methods.

Replace hand finishing with power-driven Pittsburgh Brushes for

Better Cleaning Lower Labor Costs Fewer Rejects

—as these companies did:

Removal of imbedded slag in welding test plates formerly was done by hand at the Westinghouse Electric Corp., Trafford, Pa., using a wire brush and welder's hammer. Pittsburgh brushes, powered by a direct-drive ½ h.p. motor, now remove more slag in less time, and produce a better finish. In addition, Westinghouse reports their Pittsburgh brushes "stand up better than average in use."

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De-scaling preheated bar stock at the Dominion Forge & Stamping Co., Ltd., Canada, was formerly done by hand scraping. This never did a complete job, and inclusions resulted which produced defective forgings. Pittsburgh brushes, on specially-designed machines, now do the job, and have "increased efficiency, decreased the amount of scrap, improved work quality, and saved labor."

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Cleveland—Scrap trade continues to mark time pending some definite indication of the market trend. New buying of steelmaking grades is limited but steady movement of tonnage to the mills on old contracts continues. Except for further easing in the cast grades, reflected in markdown of about $1 per ton, and some advances on certain railroad items, the market is unchanged from a week ago.

Cincinnati—Scrap prices, with few exceptions, are unchanged. Supply seems adequate. There is a good market for all grades. Local consumers are eager buyers. General thinking in the trade, however, is that any price change that develops will be on the downside.

Chicago—The scrap market provided nothing spectacular last week either in price changes or buying activity. O'd ceiling prices prevail on the better grades of open-hearth and electric furnace steel. With inventories ranging up to 60 days mills are in a position to let the market find its natural price level. Turnings are a little weaker with blast furnace items particularly sluggish and nominal. There is plenty of cast scrap but foundries are well supplied and are buying sparingly. The pressure for high prices on railroad grades continues.

St. Louis—Rush of scrap to market ahead of a possible price drop has swamped mills, whose stocks were already near 90 days and who had more owed on outstanding contracts. Granite City Steel Co. embargoed shipments Mar. 12 for an indefinite period. Laclede Steel Co. has limited deliveries to 500 tons per broker and will do no more buying until April. Turnings are badly depressed and a price drop when predecontrol orders are completed is predicted.

Los Angeles—Confusion rules the scrap market. Prices are unchanged but the market undertone is weaker. Lighter mill buying on extended schedules indicates scrap inventories are substantial. Trade observers expect lower collections reduced by 50 per cent to eventually stabilize the market. The market is weaker as melters' activities slow. Sales of No. 1 cupola cast are being made at $38 to $41, down $3 to $6.

Seattle—The leading scrap consumer in this district last week reduced prices on No. 1 and No. 2 melting steel and bundles from $3 to $4 per ton. New prices are: No. 1 heavy melting, $30; No. 1 bundles, $29; No. 2 heavy melting, $26; No. 2 bundles, $24; turnings and borings, $15. This mill announced it will buy remote scrap at minus $3 base, maximum freight allowed $6.

Warehouse . . .

—Warehouse Prices, Page 133

Philadelphia—District warehouses are reducing their prices on galvanized sheets with the decline reflecting not only the reduction in zinc to 11 cents per pound, but sharp competitive conditions. Momentarily at least the market on No. 1 gage galvanized is 7.70c, on country basis, and 7.95c, city. Reflecting recent adjustments in mill prices, prices on hot-rolled alloy bars, No. 4140, are slightly higher at 10.89c. Meanwhile, over-all warehouse business continues brisk.

Boston—Distributors are selling more steel to usual warehouse customers, but are short of heavier sizes of several products on which deliveries are improving in smaller sizes, namely, cold-rolled bars, including screw stock, light plates, structurals, and galvanized sheets. Carbon sheets are the fastest moving product.

Cleveland—Seasonal increase in demand is adding substantially to the order load on district warehouses. Building and construction activities are gaining with resulting rising pressure for structurals and reinforcing.

Chicago—Warehouse steel demand holds exceptionally strong. Daily sales are averaging about the same as in January and February.

San Francisco—Warehouse sales are rising. Stocks continue unbalanced with cold-rolled sheets among the items in greatest stringency.

Seattle—Warehouse steel order volume is steady. Demand is well maintained and appears to be increasing. Inventories are rising slowly.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1390 tons, hangar No. 7, International Airport, Queens, for the Port of New York Authority, to Lehigh Structural Steel Co., Allentown, Pa.

1350 tons, office building, Acacia Life Insurance Co., Washington, D. C., to Belmont Iron Works, Eddystone, Pa.

940 tons, building, Argonaut Division, General Motors Corp., Harrison, N. J., to the American Bridge Division, United States Steel Corp., Pittsburgh.

545 tons, building, Prentice-Hall Inc., Edgewood Cliffs, N. J., to White Plains Iron Works, White Plains, N. Y.

For bank, two plant buildings, Electro Metallurgical Division, Union Carbide & Carbon Corp., Cleco, O., 245 tons for building No. 64, going to the O'Neil Steel Co., Birmingham, Ala., and 245 tons for building No. 65, to Bethlehem Fabricators, Bethlehem, Pa.

[illegible] tons, assembly building, Standard Builders Inc., Simsbury, Conn., to Standard Structural Steel Co., Hartford, Conn.

367 tons, bridge, Central Railroad of New Jersey, Plainfield, N. J., to Bethlehem Steel Co., Bethlehem, Pa.

340 tons, apartment house extension, 34th St. and Park Ave., New York, through Tishman Construction Co., to Bethlehem Steel Co., Bethlehem, Pa.

290 tons, Deep Water power house extension, Ebasco Services Inc., Houston, Tex., to O'Neil Steel Co., Birmingham, Ala.

225 tons, six buildings, Chemical Division, Union Carbide & Carbon Corp., Torrance, Calif., to Bethlehem Steel Co., Bethlehem, Pa.

170 tons, state bridge work, Green county, New York, through Savin Construction Co. to Bethlehem Steel Co., Bethlehem, Pa.

135 tons, Army maintenance warehouse, Indian Gap, Pa., to the Goetz Welding Co., Harrisburg, Pa.

100 tons, Gait Block Co., warehouse, Bangor, Me., to Bancroft & Martin Rolling Mills Co., Portland, Me.

STRUCTURAL STEEL PENDING

40,000 to 45,000 tons, state thruway bridge over Hudson river, off Rockland county, plans now being issued; some tons of beam spans for approaches were placed a few weeks ago with American Bridge Division, United States Steel Corp., Pittsburgh.

1000 tons, municipal hospital, Newark, N. J., bids Mar. 26.

1000 ton, estimated, municipal hospital

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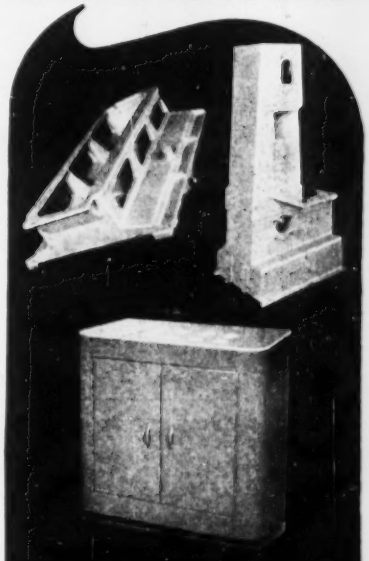

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Coney Island, New York city, bids to be closed by Department of Public Works, Apr. 5.

1000 tons, East Capital bridge, director of bridges, Washington, D. C., contract No. 2, bids Apr. 6.

500 tons, addition to the Eastern Pennsylvania Psychiatric Institute, Philadelphia, bids postponed to Apr. 22.

2300 tons, girder spans, two bridges, Huron river, Erie county, O., bids Mar. 25 to Ohio Turnpike Commission, Columbus, O.

1620 tons, twin bridges, Sandusky river, Ohio Turnpike Commission, Sandusky, O., bids 11 to commissioners, Columbus, O.

1630 tons, wide flange I-beams for welded structure, bids to Corps of Engineers, Pittsburgh.

1625 tons, structural beams for bridges, bids to Corps of Engineers, Pittsburgh.

1450 tons, highway bridges and pavement, Trumbull county, O., contract C-5, bids Apr. 1, Ohio Turnpike Commission, Columbus, O.

1140 tons, highway bridges and pavement, Sandusky, O., contract C-36, bids Apr. 1, Ohio Turnpike Commission, Columbus, O.

1100 tons, state highway bridges, Mahoning county, O., contract C-2, bids to Ohio Turnpike Commission, Columbus, O.

1250 tons, five overpasses, Trumbull county, O., contract C-7, bids in to the Ohio Turnpike Commission, Columbus, O.

1200 tons, Navy hangar, Memphis, Tenn., bids asked.

1100 tons, state highway bridges, Mahoning county, O., bids to Ohio Turnpike Commission, Columbus, O.

750 tons, highway bridges and pavement, Sandusky, O., contract C-37, bids Apr. 1, Ohio Turnpike Commission, Columbus, O.

700 tons, state highway bridge, Coosa river, Gadsden, Ala., bids Mar. 25, state highway director, also 42,732 feet, 10-inch bearing piles.

630 tons, warehouse, armory, Springfield, Mass., E. F. Carlson Co., Springfield, low.

600 tons, Washington state Skagit river swing-span bridge, bids to Olympia, Wash., Apr. 11.

540 tons, highway bridges and pavement, Trumbull county, O., contract C-9, bids Apr. 1, Ohio Turnpike Commission, Columbus, O.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1100 tons, Elmendorf Air Field hospital, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle; J. C. Boespflug Construction Co., Seattle, general contractor.

400 tons, Pacific Telephone & Telegraph Co. accounting building, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle; Howard S. Wright & Co., Inc., Seattle, general contractor.

Unstated, office building for Canadian Bank of Commerce, Vancouver, B. C., to unstated interest, general contract to British Columbia Bridge & Dredging Co., Vancouver, B. C., $2,213,000.

REINFORCING BARS PENDING

1600 tons, highway bridges and pavement, Sandusky county, O., contract C-36, bids Apr. 1, Ohio Turnpike Commission, Columbus, O.

1000 tons, highway bridges and pavement, Trumbull county, O., contract C-5, bids Apr. 1, Ohio Turnpike Commission, Columbus, O.

675 tons, state highway bridges, Mahoning county, O., bids to Ohio Turnpike Commission, Columbus, O.

670 tons, five overpasses, Trumbull county, O., contract C-7, bids in to Ohio Turnpike Commission, Columbus, O.

630 tons, highway bridges, Mahoning county, O., contract C-2, bids to Ohio Turnpike Commission, Columbus, O.

550 tons, highway bridges and pavement, Sandusky county, O., contract C-37, bids Apr. 1, Ohio Turnpike Commission, Columbus, O.

450 tons, Corps of Engineers, Pittsburgh, Inv. 28, bids Mar. 24.

360 tons, state highway bridge, Coosa river, Gadsden, Ala., bids Mar. 25, state highway director.

335 tons, highway bridges and pavement, Trumbull county, O., contract C-9, bids Apr. 1, Ohio Turnpike Commission, Columbus, O.

325 tons, two bridges, Huron river, Erie county, O., bids Mar. 25 to Ohio Turnpike Commission, Columbus, O.

290 tons, twin bridges, Sandusky river, Ohio Turnpike Commission, Sandusky, O., bids to commissioners, Columbus, O.

165 tons, Washington state Skagit river bridge approaches, bids to Olympia, Apr. 11.

1067 tons, Washington state road projects, Clark, Lewis and Thurston counties, bids to Olympia, Mar. 31.

Unstated, laundry and cleaning plants, Ladd Air Field, Alaska, Lytle & Green and S. Birch & Sons, Seattle, low $1,159,682 to U. S. Engineer.

PLATES . . .

PLATES PLACED

1400 tons, pipe fabrication for Hanford project expansion, to Consolidated Western Steel Corp., Seattle; Kaiser Engineers, general contractor.

425 tons, tank, Metcalfe-Hamilton Co., Topeka, Kans., to Bethlehem Steel Co., Bethlehem, Pa.

300 tons, Washington state Fox Island bridge to Columbia Steel Corp.; Manson Construction & Engineering Co., Seattle, general contractor.

PIPE . . .

CAST IRON PIPE PENDING

460 tons, King County District No. 42, bids in Mar. 17.

250 tons, bids including alternatives, to Winslow, Wash., Mar. 18.

Unstated, 17,000 feet, 6 and 4-inch, and accessories, for four LID districts, bids to Ivy Stallsmith, secretary, Alderwood Manor, Wash., Mar. 23.

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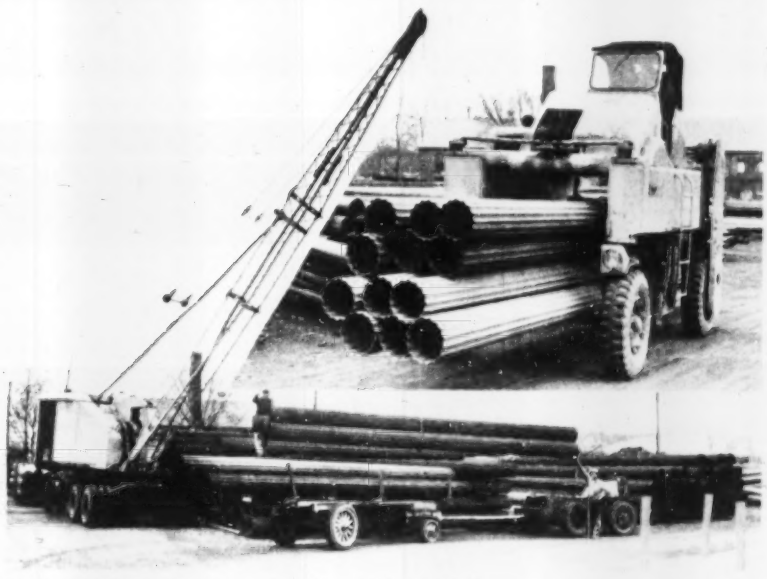


The Old and New in Handling Tubes

Union Metal Mfg. Co., Canton, O., demonstrates new and old methods of handling tubes. In the above photograph, a crane, tractor and trailer carry out earlier tube moving techniques. Replacing tractors and trailers in carrying Monotubes, a tube product of Union Metal, is the straddle truck shown in the insert

Ellicott Acquires Novelty Works

Ellicott Machine Corp., Baltimore, manufacturer of hydraulic dredges and dredging machinery, acquired the Novelty Steam Boiler Works Co., Westport, Md., steel tank producer. Aside from change in ownership, the plant will be operated as formerly, under the name Novelty Steam Boiler Works Inc.

Plans To Spend $31 Million

Consolidated Gas Electric Light & Power Co., Baltimore, plans to spend about $31 million on new facilities this year, compared with $28 million appropriated for the same purpose in 1952.

Martin Adds to Installations

Glenn L. Martin Co., Middle River, Md., is starting work on a four-story addition to its engineering building. The addition will contain about 90,000 square feet.

Army Okays Bridge Plans

The Department of the Army approved plans to build a four-lane suspension bridge across the Straits of Mackinac to link the peninsulas of Michigan. Spanning 3800 feet between the suspension towers, it will be the second longest suspension bridge in the world. It will be constructed by the Mackinac Bridge Authority of the state of Michigan at an estimated cost of $95 million.

To Hold Welding Clinic

A three-day welding clinic coinciding with formal opening of a new warehouse of the Steel Sales Co. of Indiana in Indianapolis has been announced for Apr. 15, 16 and 17. Welding experts of leading metal companies will participate.

Appoints New Representative

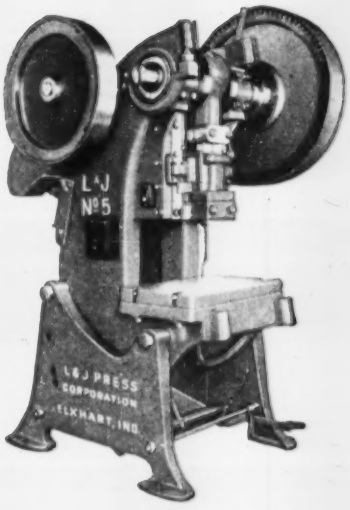
Homestrand Inc., Larchmont, N. Y., distributors of Swedish measuring tools and instruments, appointed Empire Tooling Association, Birmingham, Mich., as exclusive representative in that state.

Sales Representatives Named

John B. Moore Corp., Nutley, N. J., appointed sales representatives in eastern New York, and Kansas, Oklahoma and western Missouri. The two companies in the respective areas are Caldwell Chemical Co., New York, and James B. Schooler Co., Kansas City, Mo.

G.E. Adds Workers

General Electric Co.'s Erie Works, Erie, Pa., expects to add about 700 workers within a few weeks follow-



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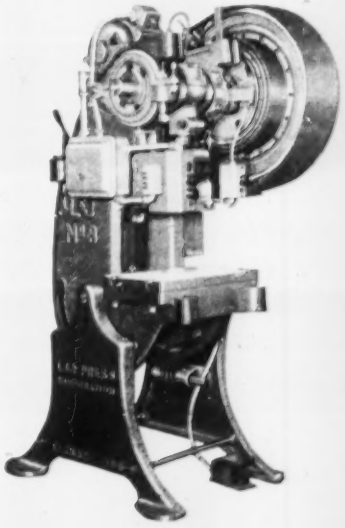

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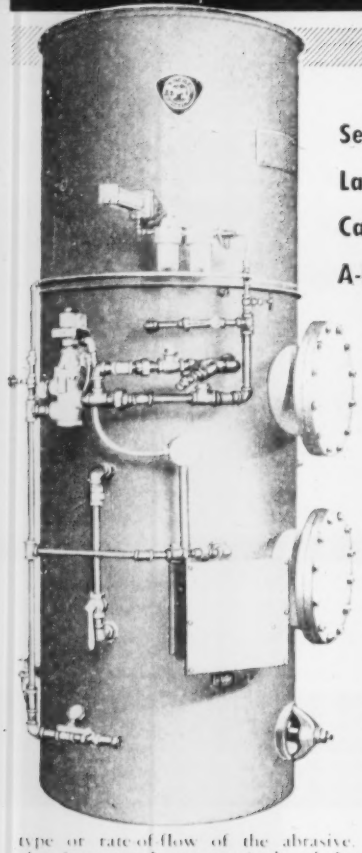

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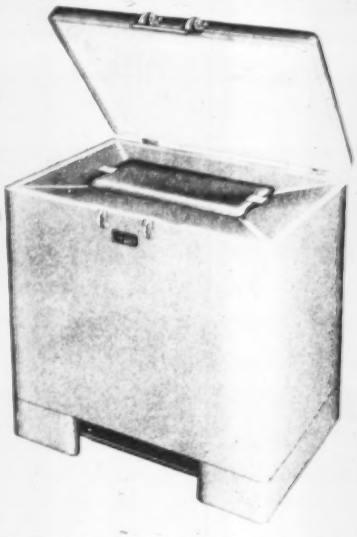

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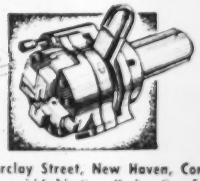

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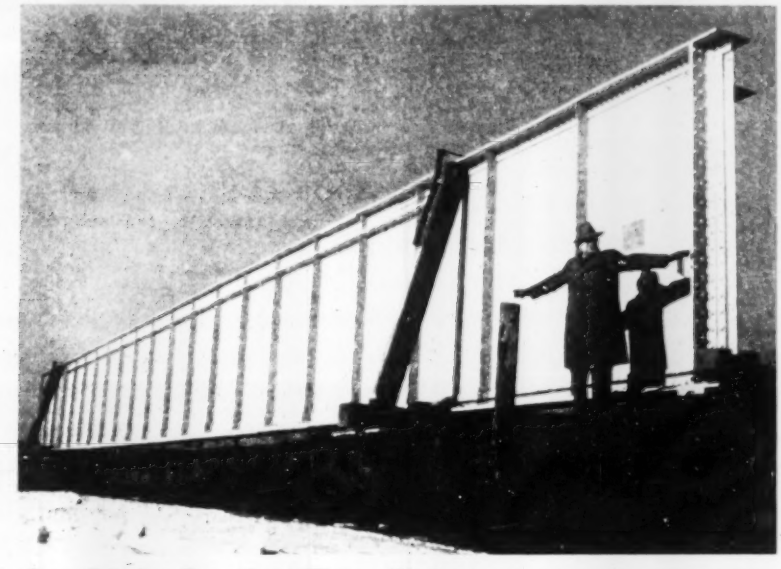


One Girder Requires Three Flatcars

Three railroad flatcars of standard size are needed to transport a 120-foot bridge girder manufactured by American Bridge Division of U. S. Steel Corp. to a construction site at Chamberlain, S. Dak. One of 50 similar girders shipped by American Bridge to that destination, the steel girder weighs 47 tons

ing settlement of a locomotive company strike which affected production schedules at the G.E. plant making electrical equipment for locomotives.

Moving Chicago Operations

Smeeth-Harwood Co. is moving operations from 2101 W. Cermak Rd., Chicago, to 8521 S. Vincennes Ave., in that city. More space will be available and facilities for production of steel mill brass and bronze castings were added.

Marquardt Breaks Ground

Ground-breaking has been conducted for a new engineering and office building for Marquardt Aircraft Co., Van Nuys, Calif.

Appoints St. Louis Agent

Economy Equipment Co., St. Louis, was named agent for sale of standard industrial equipment in Missouri, Kansas and southern Illinois by Surface Combustion Corp., Toledo, O.

Kennametal Names Exporters

Kennametal Inc., Latrobe, Pa., appointed the following export representatives: L. D. Seymour & Co., New York, for Japan and Koopman & Co., Amsterdam, The Netherlands, for Indonesia.

Ryerson Builds Warehouse

Joseph T. Ryerson & Son Inc., Chicago, announces that construction has started on a steel service plant for the firm's operations in Milwaukee. The new plant, to consist of two large building units and an office building, will have about 166,000 square feet of floor space.

S. A. Hirsh Expands Facilities

Production facilities of S. A. Hirsh Mfg. Co., Skokie, Ill., shelving manufacturer, will be expanded soon by 60 per cent.

Eutectic Opens Three Branches

Eutectic Welding Alloys Corp., Flushing, N. Y., opened three divisional branch offices in Chicago, Barmingham and Columbus, O.

Breuer Adds to Facilities

Breuer Electric Mfg. Co., Chicago, acquired an 8000-square-foot building adjoining its present plant for increasing production facilities.

Pittsburgh Distributor Named

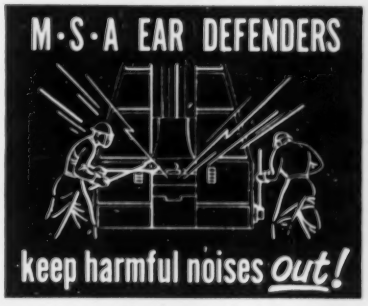
Moto-Truc Co., Cleveland, named John R. Banbury Equipment Co. as its Pittsburgh distributor.

Lane Made Representative

Rivett Lathe & Grinder Inc., Boston, appointed Lane Engineering Co., Buffalo, as representative in that area for Rivett's air and hydraulic valves, cylinders and power units.

Develops New Freight Car

Pullman-Standard Car Mfg. Co., Chicago, reported development of a



If your workers "can't hear themselves think," chances are *you'll* hear about it in lowered production and damaged hearing.

Loud industrial noises sap energy, interfere with job concentration, and sometimes result in serious hearing loss. M.S.A. Ear Defenders block out these costly noises, yet allow wearer to hear warning signals, speech, and telephone conversation.

M.S.A. Ear Defender design insures comfortable fit; complete closure of ear canal; easy to insert, remove. Ear Defenders are easily cleaned with soap and water. Convenient carrying case keeps them clean in pocket. Write for details.

MSA

Mine Safety Appliances Co.
Braddock, Thomas & Meade Sts.
Pittsburgh 8, Pa.

INDUSTRIAL
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Need Rails—Switches—Frogs—Guard Rails—Track Tools? For best selections, prompt deliveries—*try FOSTER*—shipments from stock in 5 nationwide warehouses.

Call on FOSTER for everything in Industrial Track Equipment and supplies.

RAILS New and Relaying

Send for Track Equipment Catalog # S-3

L. B. FOSTER CO.
STEEL SHEET PILING • PIPE • WIRE ROPE
PITTSBURGH 30, PA. NEW YORK 7, N.Y.
CHICAGO 4, ILL. HOUSTON 2, TEX.

Beechcraft Trainer Goes Into Mass Production

Sustained quantity production of this T-34A primary trainer has been ordered in the United States and Canada by the Air Force. Beech Aircraft Corp., Wichita, Kans., designed the all-metal two-place airplane. The T-34A has top speed of 180 miles per hour, a service ceiling above 20,000 feet and a 785-mile range

new standardized freight car with self-clearing hopper chutes.

Equipping for Expansion

General Engineering Inc., Baltimore, is equipping 12,000 square feet in additional facilities for manufacture of metal stampings, tools and dies.

Moves Baltimore Plant

J. Rothstein & Son, Baltimore, moved its plant to a new Baltimore site.

Builds Calendaring Machine

Farrel-Birmingham Co., Ansonia, Conn., designed and built a 130-ton calendaring machine to smooth and surface plastic sheeting. Its 92-inch rollers will handle the fabric at the rate of nearly 500 feet a minute.

Makes Unique Gyroscope

A minature gyroscope made by Sanders Associates, Nashua, N. H., spins at 24,000 revolutions a minute, the New England Council reports. The instrument, two inches high and one inch in diameter, is expected to have wide use in aircraft instruments, radar apparatus and guided missiles.

Sales Gain for Douglas

Last year's sales of Douglas Aircraft Corp., Santa Monica, Calif., totaled $522,619,000, a gain of 132 per cent over those in 1951. Employment rose from 44,000 at the end of 1951 to 62,200 at the end of 1952.

Moving Into Los Angeles

A survey by the Los Angeles Chamber of Commerce disclosed that more than 300 eastern manufacturers have branch plants in Los Angeles and 31 per cent of them were established in that area during the last three years.

Opens New Assembly Plant

Detroit Stamping Co., Detroit, opened an assembly plant for manufacture of production work holding tools in Birmingham, Mich.

Changes Company Name

The name of Independent Engineering & Drydock Co., Alameda, Calif., was changed on Mar. 9 to Plant Shipyard Corp. There is no change in management, stockholders, assets or operating personnel.

Friedman Buys Warehouse Site

Friedman Iron & Supply Co., Ft. Worth, Tex., distributors of steel products, purchased a site for a new warehouse in Houston.

J. Keith Davis Honored

J. Keith Davis, vice president and sales manager of Kelley Mfg. Co., Houston, was elected president of the Texas chapter of the American Steel Warehouse Association Inc.

Elect Association President

W. G. Schlichting, sales manager of the Heating, Cooling & Air Conditioning Division of Young Radiator Co., Racine, Wis., was elected president of the Industrial Unit Heater Association.

Form Lanston Industries

Lanston Monotype Machine Co., Philadelphia, and Cuno Engineering Corp., Meriden, Conn., will merge into Lanston Industries Inc.

Studies European Methods

C. O. Burgess, technical director of Gray Iron Founders' Society Inc., Cleveland, has gone to study research methods in Great Britain, France and Switzerland.

Handles Sales and Engineering

A new firm, H. A. Pietsch Co., Pittsburgh, will handle engineering and sales of equipment for commercial and industrial heating, air conditioning, processing and combustion in western Pennsylvania, eastern Ohio and West Virginia. The company will represent several nationally-known manufacturers.

Purchases Milwaukee Firm

Purchase of the Milwaukee Equipment Mfg. Co. by the Food Machinery & Chemical Co., Milwaukee, was announced by both companies.

Canadian Affiliation

George H. Elliott & Co., management consultant of New York, announces affiliation and controlling interest in Leetham, Simpson Ltd., management consultants of Montreal and Toronto, Canada.

Resumes Commercial Production

Hiller Helicopters, Palo Alto, Calif., started production of commercial units of the 12-B helicopter for the first time since outbreak of the Korean war.

Opens Detroit Shop

Wilson Mechanical Instrument Division, American Chain & Cable Co. Inc., opened a new service shop in Detroit with facilities for servicing and repairing Rockwell and Tukon hardness testers.

New Milwaukee Office

Ehret & Kinsey, Chicago representatives of the Cleveland Worm & Gear Co. and the Farval Corp., opened a Milwaukee office at 2400 West Clybourn.

G. A. Gray Plans Expansion

The G. A. Gray Co., Cincinnati, announced a planned expansion pro-

RAILROAD EQUIPMENT—*FOR SALE*

USED **AS IS** **RECONDITIONED**

STANDARD GAUGE FREIGHT CARS

Box, Steel Sheathed, 40-Ton Capacity
Box, Double Sheathed, 50-Ton Capacity
Box, Single Sheathed, 50-Ton Capacity
Flat, 50-Ton, Steel Underframe, 40'6" Long
Gondolas, Composite, or All Steel 50-Ton and 70-Ton
Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
Tank, 3,000-Gallon, High Pressure
Tank, 8,000-Gallon, Coiled and Non-Coiled

Hoppers, All-Steel, 70-ton, *Cross Dump*

EXTRA LONG FLAT CARS

40 & 50-Ton Capacity, Length 70' and 74'

CABOOSE CARS

Eight Wheel, Cupola Type

STANDARD GAUGE AIR DUMP CARS

Side Dump, 20-Yd., 40-Ton, Lift Door

End Dump, 20 Yd., 50-Ton Drop Door

Side Dump, 30-YD., 50-TON, DROP DOOR

OTHER EQUIPMENT

Jordan Spreader
Burro Crane #15
Overhead Cranes
Railroad Track Scales

STANDARD GAUGE DIESEL-ELECTRIC ROAD SWITCHING LOCOMOTIVE

300 H.P., 70-Ton, Type 0-4-4-0
NEW AND RELAYING RAIL

Send us your inquiries **WE BUY FREIGHT CARS FOR DISMANTLING** ***Send us your offerings***

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New York 7, N. Y.
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6,000 Gallon
8,000 Gallon
10,000 Gallon

"ANYTHING containing IRON or STEEL"

CLASSIFIED ADVERTISING

Accounts Wanted

MANUFACTURERS' REPRESENTATIVE with office located in Detroit, Michigan, desires additional lines. Now handling cold-headed items, springs, selling all automotive concerns and diversified industries. Desires well rated washer, stamping or wire cloth line. Write Box 681, STEEL, Penton Bldg., Cleveland 13, Ohio.

Positions Wanted

MANUFACTURING EXECUTIVE: CAPABLE OF DIRECTING ALL PHASES OF OPERATION. COLLEGE GRADUATE. SEVERAL YEARS ACTUAL SHOP TRAINING PRIOR TO MANAGEMENT. BROAD BACKGROUND IN METAL WORKING AND MACHINING, FOUNDRY, ASSEMBLY, GALVANIZING AND OTHER FINISHES. EXCELLENT RECORD IN PRODUCTION AND IN LABOR RELATIONS. EXPERIENCED IN JOBBING AND MASS PRODUCTION. WILL RELOCATE. CAN PRODUCE ANY METAL PRODUCT. WRITE BOX 656, STEEL, PENTON BLDG., CLEVELAND 13, OHIO.

EXECUTIVE EXPERIENCED AS PLANT MANAGER with cost and production experience. Sound industrial background in administrative and management functions. 25 years' experience. B.S. Degrees M.I.T. Write Box 693, STEEL, Penton Bldg., Cleveland 13, Ohio.

PURCHASING EXECUTIVE. Heavy Exp. Mfrs. steels, ferrous, nonferrous shapes and alloys, exptr. in Navy. Now Purch. Dir. national mfr. consumer durables. B.S. in M.E. Age 36, married. Will relocate. Write Box 687, STEEL, Penton Bldg., Cleveland 13, Ohio.

CLASSIFIED RATES

All classifications other than "Positions Wanted" set solid, minimum 50 words, $12.50 each additional word 25; all capitals, minimum 50 words $16.00 each additional word 32; all capitals leaded, minimum 50 words $19.50 each additional word 39. "Positions Wanted" set solid, minimum 25 words, $3.00, each additional word 12; all capitals, minimum 25 words $3.75 each additional word 15; all capitals leaded, minimum 25 words $4.50 each additional word 18. Keyed address takes seven words. Cash with order necessary on "Positions Wanted" advertisements. Replies forwarded without charge. These rates are subject to 15 per cent agency commission and 2 per cent cash discount ten days. Displayed classified rates on request. Address your copy and instructions to STEEL, Penton Bldg., Cleveland 13, Ohio.

Help Wanted

CHEMIST with manufacturing experience for Metal Plant in Northeast Philadelphia. Permanent position with good future. Write Box 694, STEEL, Penton Bldg., Cleveland 13, Ohio.

STEEL SALESMAN. Aggressive young man for training in sales of our Swedish Cold Rolled Strip Steel Specialties and Tool Steels. Middle West territory, mainly Michigan. Send complete resume including education, experience and salary to Sales Manager, Uddeholm Company of America, Inc., 155 East 44th Street, New York 17, N. Y.

SMALL FABRICATING PLANT ESTIMATOR. Must have experience in take off, estimating for component parts of ships, et cetera. Must have shop experience as to layout and production. Warrants good salary for capable man in small town North Florida. Replies held confidential. Applicant must have good references. Write Box 672, STEEL, Penton Bldg., Cleveland 13, Ohio.

FOR SALE

Planer, Niles-Bement-Pond Table 60" wide, 20 ft. long, 36" high from table to cross rail. Direct Motor Drive-DC current through AC-DC Motor Generator Set. May be seen operating on either day shift or early evening night shift. ($9250.00.) **Write Box 678, STEEL, Penton Bldg., Cleveland 13, Ohio.**

SURPLUS STEEL & ALUMINUM BAR
(Aircraft Quality)

Many sizes of C1137 & 4130 Steel, 17ST & 24ST aluminum rounds & hexagons. Specifica. Tube re certification facilities. Phone or write for sizes, quantities and prices.

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why not line up sub-contract work through an advertisement in this section? For additional information or rates, write STEEL, Penton Bldg., Cleveland 13, O.

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STRUCTURAL STEEL DETAILERS

and checkers. Long range work. Top rates for top experienced men. Send resume in confidence of work history, detailed experience etc. to:

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Expanding to Nationwide Coverage. We will need sales representation in several choice territories. Write for details of our excellent proposition.

United States Diamond Wheel Co.
835 Illinois Ave. Aurora, Illinois

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Must have experience, good references, to sell tool steel in the New York area for one of the nation's leading producers. This is interesting work offering future security with many employee benefits. Salary. Replies held strictly confidential.

Write Box 692, STEEL
Penton Bldg. Cleveland 13, Ohio

Consolidated Welding & Engineering Co.

ENGINEERS
CONSULTANTS—DESIGNERS

Designers of Special Machinery,
Dies, Jigs & Fixtures.
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Ferrous & Non-Ferrous Materials

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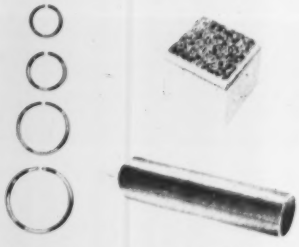
Chesapeake 3-3270

ORDNANCE CONTRACTORS! READ THIS!

If your shell, rocket or Burster job specifies brazing with Silver Alloy Rings, it will pay you to contact the one manufacturer who completes the job — and at minimum costs.



Alloying to certified Govt. Specifications, rolling, wire drawing and ring forming to your Blue Print tolerances — all these processes performed in one UNITED WIRE mill! Meaning . . . one control — of alloy composition, of precise ring dimensions, of shipping schedules! And . . .

A competent and experienced staff of brazing specialists, with their completely modern laboratory, is anxious to work with you.

If you have any silver alloy brazing problems, why not turn them over to

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★ SIL-BOND 50 Govt. Grade IV
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Contact your nearest UNITED WIRE Welding Supply distributor or write our nearest office.

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SALES OFFICES
New York, Rochester, Minneapolis, Chicago, Lansing, Mich., Pittsburgh, Hartford, Conn., Akron, Philadelphia, Los Angeles, Springfield, Mass.

gram involving two sizable building additions.

To Erect New Office

Sanderson-Halcomb Works of Crucible Steel Co. will erect a new office building in Syracuse, N. Y., at an estimated $150,000.

Offers New Service

Radioactive Products Inc., Detroit, is offering encapsulation services on radioactive sources.

Louis Allis Names Consultant

Sundberg-Ferar, industrial designers, Royal Oak, Mich., announces that the firm was retained as design consultants by Louis Allis Co., Milwaukee.

Rust Gets Construction Contract

Rust Engineering Co., Pittsburgh, was awarded a contract for construction of a new tall oil processing plant for Newport Industries Inc., at Bay Minnette, Ala.

Northrop Backlog High

Northrop Aircraft Inc., Hawthorne, Calif., received Air Force orders for production of guided missiles of an undisclosed amount. The planemaker's backlog reached an all-time high in excess of $500 million.

New Iowa Plant

Globe-Union Inc., Milwaukee, is starting construction of a new factory for the Ft. Dodge, Iowa, plant of its Centralab electronics division.

Lab Plans Syracuse Building

Lab Corp., testing machine manufacturer, will erect a new plant in Syracuse, N. Y.

Oliver Opens Sales Office

Oliver Iron & Steel Corp. announces location of a new general sales office in the Oliver building, Pittsburgh.

To Build in Pennsylvania

Industrial Development Corp., Indiana, Pa., will construct a new plant for Robertshaw-Fulton Controls Co. in that city. The project will contain about 53,000 square feet of floor space, a railroad siding and parking facilities.

Nesco Acquires Steelware

Steelware Mfg. Co., Los Angeles, was acquired by Nesco Inc., Chicago.

Magnaflux Moves

Magnaflux Corp. is moving to a new plant and general offices at 7300 W. Lawrence Ave., Chicago.

Forms New Division

Michigan Tool Co., Detroit, formed a separate division to produce and market a new line of industrial chemical products which have been under development at Michigan Tool for several years. The new division will be known as Shear-Speed Chemical Products Division.

Expand for Large Castings

Farrell-Cheek Steel Co., Sandusky, O., producer of electric furnace carbon and alloy steel castings, announced completion of expansion for production of steel castings up to 2000 pounds.

Moving Seattle Headquarters

Union Carbide & Carbon Corp., Seattle, will move local headquarters to 3404 4th Ave., where a leased building has been revamped for the corporation. Divisions of Union Carbide & Carbon sharing this building will include Carbide & Carbon Chemicals Co., Linde Air Products Co. and Haynes Stellite Co.

Fire at Gerrish Machinery

The plant of Gerrish Machinery Co., Tacoma, Wash., was destroyed in a $40,000 fire. Much of the loss was machinery. The losses are covered by insurance.

H & B Buys Brooklyn Plant

H & B American Machine Co., Chicago, purchased Karp Metal Products Co. Inc., Brooklyn, N. Y., a manufacturer of specially fabricated sheet metal products.

Regional Plan Created

American Type Founders, Elizabeth, N. J., created a new regional distribution plan for its products and services. The country has been divided into 12 districts, each with complete service, warehousing and sales office facilities.

Flexible Tubing Contract

Flexible Tubing Corp., Guilford, Conn., received a $300,000 contract from the Air Force for production of special flexible tubing.

Birmingham Builds Lead Plant

Birmingham Lead & Smelting Co., Birmingham, will build a plant north of the city for purchase, smelting and refining of secondary lead. The plant will contain 8000 square feet of floor space.

New Operation for Crown

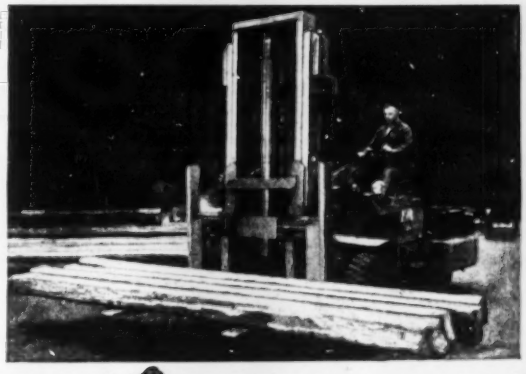
Crown Cork & Seal Co., Baltimore, will establish a new operation at Leeds, Ala. The company will manufacture crown seals in a modern building with 75,000 square feet of space.

Advertising Index

Air Products, Inc.	89
Air Reduction	100, 101
Alan Wood Steel Co.	132
Alliance Machine Co., The	106
Aluminum Company of America	24, 25
American Bridge Division, United States Steel Corporation	139
American Drill Bushing Co.	73
American Machine & Foundry Co.	141
Armco Steel Corporation	42
Baldwin-Lima-Hamilton Corporation	115
Barium Steel Corporation	2
Beloit Foundry Co.	108
Beryllium Corporation, The	111
Bethlehem Steel Co.	1
Blaw-Knox Co., Rolls Division	29
Browning, Victor R., & Co., Inc.	148
Bryant Chucking Grinder Co.	30, 31
Bullard Co., The	60
Carborundum Co., The	34, 35
Carpenter Steel Co., The	32
Champion Rivet Co., The	153
Clark Controller Co., The	26
Cleveland Steel Tool Co., The	146
Cleveland Welding Co., The	141
Cleveland Worm & Gear Co., The	Inside Back Cover
Columbia Steel & Shafting Co., Summerill Tubing Company Division	90
Continental Steel Corporation	27
Copperweld Steel Co.	63
Cutler-Hammer, Inc.	Back Cover
Dempster Brothers	136
Denison Engineering Co., The	7
Detroit Stamping Co.	146
Diamond Mfg. Co.	148
Dracco Corporation	14
Eastern Machine Screw Corporation, The	148
Eaton Manufacturing Co., Reliance Division	74
Elastic Stop Nut Corporation of America	117
Electric Controller & Mfg. Co., The	Inside Front Cover
Enthone, Inc.	104
Fawick Airflex Division, Federal Fawick Corporation	71
Federal Fawick Corporation, Fawick Airflex Division	71
Firestone Steel Products Co.	45
Follansbee Steel Corporation	120
Foster, L. B., Co.	149
Fray Machine Tool Co.	105

Continued on following page

HEAVY INDUSTRY HARNESSES HEAVY-DUTY FORK **LIFTRUK** ON THE PRODUCTION LINE!



Here you see a LIFTRUK in The Timken Roller Bearing Company plant, Canton, Ohio, carrying a load of blooms. This is but one of hundreds of important movements required of a LIFTRUK in the metal production fields.

LIFTRUKS are available in 5 - 7½ - 10 - 15 Ton capacities. Larger sizes to order.

SEND FOR BULLETIN 77

LIFTRUK features = 1—Rugged dead axle for traction wheels. 2—Extra large elevating hydraulic cylinders. 3—Oversize engine clutch. 4—Generous sturdy construction of tiering frames and fork apron—these and other LIFTRUK features assure you of production materials handling and elimination of shut downs or slow ups.

Let our sales engineers give convincing proof of LIFTRUK performance to meet *your* specific needs.

Also available with Boom, Ram, Scoop and other attachments.

SILENT HOIST & CRANE CO.

849 63rd STREET, BROOKLYN, N. Y., U. S. A.

IT NEVER FAILS! by LI'L CHAMP

T.K. JOHNUM A.E. SALESMEN FOR CHAMPION ELECTRODES, SPENT A MONTHS PAY ON NEW GLAD-RAGS FOR THIS BIG CALL...
OKAY, YOU'RE ON IF THIS ROD IS ALL YOU SAY... LET'S GIVE IT A TRY ON A VERY SIMPLE JOB IN THE SHOP!!!
THE CHAMPION RIVET CO.
COMES THE TRY OUT ON THAT SIMPLE JOB — YOU GUESSED IT... T.K. SOLD CHAMPION ELECTRODES BUT HE'LL WORK THE SWINDLE SHEET OVERTIME JUST TO PAY OFF THE CLEANING BILL FOR HIS CLOTHES...
DON'T LAUGH BOYS THE POOR GUY MAY DIE — BUT NOONE OF YOU COULD REPAIR THIS BOILER REMEMBER?
DID IT ON THE FIRST TRY!!
THE TOUGHEST JOB IN THE SHOP — AND HE PUTS A $150 SUIT TO PROVE IT CAN BE DONE BY CHAMPION
IT NEVER FAILS!

THE CHAMPION RIVET CO.

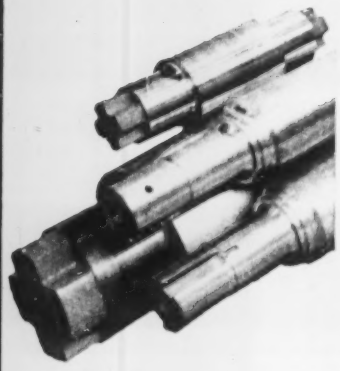
CLEVELAND, OHIO — *East Chicago, Ind*

Hyde Park

RED CIRCLE Rolls ALLOY-CHILLED

Red Circle Rolls for all Purposes

Hyde Park Red Circle Rolls are outstanding in quality and in performance and are easily identified by the Red Circle.



for
finer finish
long life
greater tonnage
Specify Red Circle

Chilled Rolls
Alloy Iron Rolls
Moly Rolls
Nickel Chilled Rolls
Grain Rolls
Cold Rolls
Sand Rolls

Hyde Park

FOUNDRY & MACHINE CO.
Hyde Park, Westmoreland County, Pa.

ROLLS
ROLLING MILL MACHINERY
GREY IRON CASTINGS

Advertising Index

Concluded from preceding page

Gishaft Machine Co. 17, 18, 19, 20
Goodyear Tire & Rubber Co., Inc., The 4
Gorham Tool Co. 12
Gulf Oil Corporation 33
Gulf Refining Co. 33

Hendrick Manufacturing Co. 140
Hyde Park Foundry & Machine Co. 154
Hydropress, Inc. 97

Iron & Steel Products, Inc. 151

Kidde, Walter, & Co., Inc. 10

L & J Press Corporation 147
Landis Machine Co., The 11
Lapointe Machine Tool Co., The 15
Leeds & Northrup Co. 36
Lindberg Engineering Co. 113
Littleford Bros., Inc. 145
Lucia Brothers & Co., Inc. 135

McGill Manufacturing Co., Inc. 93
McKay Machine Co., The 55

Macleod Co., The 148
Macwhyte Co. 3
Marchant, Geo. F., Co. 140
May-Fran Engineering, Inc. 118, 119
Michigan Tool Co. 8, 9
Mine Safety Appliances Co. 149
Morey Machinery Co., Inc. 144

National Acme Co., The 23
National Steel Corporation 13

Ohio Locomotive Crane Co., The 146
Orban, Kurt, Co., Inc. 95

Pawtucket Manufacturing Co. 6
Peterson Steels, Inc. 67
Pheoll Manufacturing Co. 98
Pittsburgh Plate Glass Co., Brush Div. 144
Pollack, William B., Co., The 22
Potter & Johnston Co., Subsidiary of Pratt & Whitney Division Niles-Bement-Pond Co. 87
Precision Extrusions 5
Production Steel Co. 56

Reliance Division, Eaton Manufacturing Co. 74
Republic Steel Corporation 130
Revco, Inc. 148
Roebling's, John A., Sons Corporation 37
Rolls Division of Blaw-Knox Co. 29
Ryerson, Joseph T., & Son, Inc. 46

Sargeant & Wilbur, Inc. 16
Signode Steel Strapping Co. 112
Silent Hoist & Crane Co. 153
Simonds Abrasive Co. 110
Simonds Gear & Mfg. Co., The 142
Sperry Products, Inc. 123
Stalwart Rubber Co. 124
Standard Pressed Steel Co. 21
Streeter-Amet Co. 144
Summerill Tubing Company Division, Columbia Steel & Shafting Co. 90

Taylor-Winfield Corporation, The 143
Texas Co., The 38
Tide Water Associated Oil Co. 109
Timken Roller Bearing Co., The, Steel & Tube Division 64
Tinnerman Products, Inc. 68
Toledo Stamping & Manufacturing Co. 146

United Engineering & Foundry Co. 103
United States Steel Corp., Subsidiaries 139
United States Steel Export Co. 139
United Wire & Supply Corporation 152

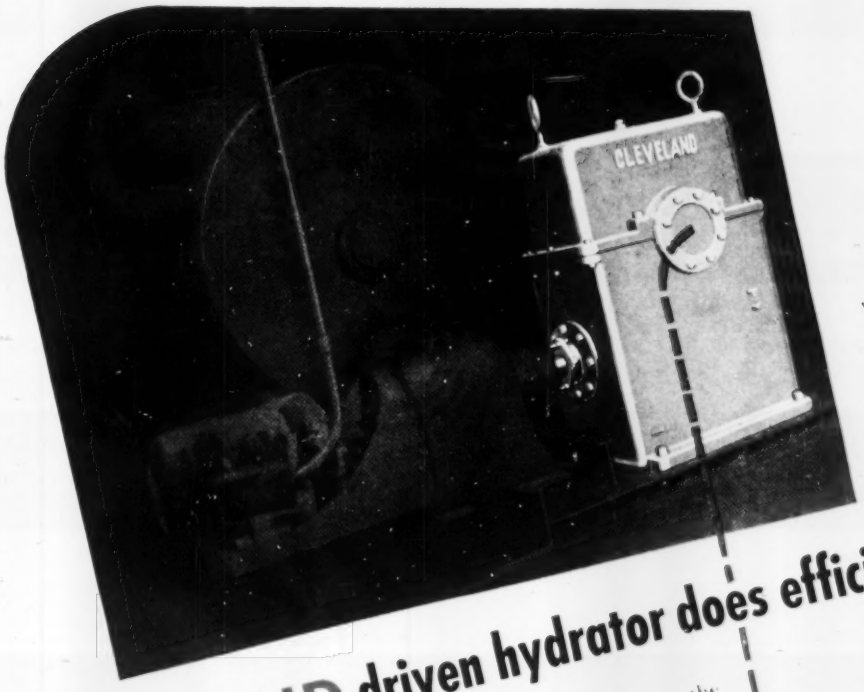
Wallingford Steel Co., The 114
Weirton Steel Co. 13
Wellman Bronze & Aluminum Co., The 116
Westinghouse Electric Corporation, Air Conditioning Division 41
Wise, Henry H., Co. 85

Youngstown Sheet & Tube Co., The 28

~ ~ ~

Table of Contents, Page 5

Classified Advertising Page 151



WORM GEARING—universal in its application—affords advantages for almost every power transmission job. Select worm-gear units to meet your need from the complete Cleveland line.

Photo of automatic hydrator in midwestern lime plant by courtesy of *Pit and Quarry*.

CLEVELAND driven hydrator does efficient mixing job

AUTOCLAVING under continuous high pressure is the crucial part of lime hydration. In this specially designed hydrator, close control of the process of mingling quicklime and water insures a product of highest quality and uniformity. The revolving agitator is driven by a Cleveland Worm Gear Speed Reducer—smoothly, at exactly the right speed, with never an interruption.

Cleveland is a compact, powerful, right-angle drive, in which a case hardened steel worm meshes with a long wearing, low friction bronze gear. Worm and gear run in an oil bath, sealed in a rugged, dust and moisture proof housing for continuous performance on the toughest jobs—in all sorts of weather—under all operating conditions.

Whenever you want a reliable, long-lived, right-angle drive, specify Cleveland. To familiarize yourself with all the types and sizes available in the complete Cleveland line, write today for Catalog 400. The Cleveland Worm & Gear Company, 3270 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

CLEVELAND
Worm Gear
Speed Reducers

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★★★
MOTOR CONTROL
C-H

★ INSTALLS EASIER

☆ U-shaped cover removes to make working parts easy to see and reach, wide open on both sides and front. Plenty of room and light to see and to work. ☆ Unit plate construction permits removal of entire mechanism by loosening just 3 screws. A dream for quick and easy conduit work and for pulling in wires. ☆ Keyhole mounting slots at top allow hanging starter on previously driven screws. An easy one-man job. ☆ Plenty of wiring space. And straight-through wiring. All line terminals at top, load terminals at bottom. No criss-cross. And every terminal can be reached with a screw driver from the *front*. ☆ Pressure connectors on *all* terminals, no slow and tedious wire looping. ☆ Easily changed magnet coil clearly marked for voltage and frequency. ☆ Many other features.

★ WORKS BETTER

☆ Positive, guided armature action. Movement on self-cleaning pivot bearings. No sloppy misalignment or sliding frictional drag. Quiet. ☆ Automatic armature kickout assures quick break and prevents false operation due to shock. ☆ Dust-safe vertical contacts stay clean. Heavy duty twin-break to minimize arcing. Fully confined in pressure-quench chambers, yet easily accessible and easily removable. ☆ Famous C-H Eutectic Element overload protection, accurate, simple, dependable. ☆ New 4-position overload heater coils permit adjustment within 3% of actual full load motor rating, dependable protection with fewer needless motor stoppages. ☆ New and exclusive, *three* coil overload protection now available in same standard starter structure and enclosure. ☆ Many other features.

★ LASTS LONGER

☆ Lifetime armature pivot bearings eliminate sliding friction and wear. Smooth, quiet, dependable operation is assured over entire life of starter. ☆ Dust-safe vertical contacts stay clean, free from grit and dirt that cause burning and pitting. ☆ New light-weight, movable contact design reduces "bounce"...and the resulting arcing and burning that shortens contact life. ☆ New pressure-quench enclosure of contacts further lengthens contact life. ☆ Vacuum impregnated magnet coil, filled with new solvent-free plastic and polymerized, is moisture-proof and non-softening even under high operating temperatures. ☆ Easy inspection due to "wide-open" construction insures regular care. ☆ Life-time enclosure, baked enamel on heavy Bonderized steel.